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GROUNDWATER MONITORING DATA  
IN SUPPORT OF  
DELISTING PETITION #0686  
FOR THE  
RIDGEFIELD BRICK AND TILE SITE  
RIDGEFIELD, WASHINGTON

PREPARED BY  
HAZARD MANAGEMENT SPECIALISTS

APRIL 24, 1987



Hazard Management Specialists

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## TABLE OF CONTENTS

	Page Numbers
I. INTRODUCTION	1
II. PRELIMINARY GROUNDWATER STUDY	5
A. HYDROGEOLOGY	5
B. WATER QUALITY	9
III. GROUNDWATER MONITORING	12
A. VADOSE ZONE MONITORING PLAN	12
B. SUMMARY OF MONITORING DATA	15

## LIST OF FIGURES

FIGURE 1 - VICINITY MAP

FIGURE 2 - GEOLOGIC MAP

FIGURE 3 - TOPOGRAPHIC MAP AND LOCAL  
WATER WELLS

FIGURE 4 - CROSS SECTION OF LOCAL WELLS

FIGURE 5 - GROUND WATER CONTOUR AND WELL  
LOCATION MAP

FIGURE 6 - SUCTION LYSIMETER MODEL

## LIST OF TABLES

TABLE 1 - RBT SITE WATER TESTING DATA (5/31/83)

TABLE 2 - RESULTS OF GROUNDWATER ANALYSES

## LIST OF APPENDICIES

APPENDIX A - WELL LOGS

APPENDIX B - LYSIMETER LOCATIONS AND LOGS

APPENDIX C - TEST PIT AND BOREHOLE LOGS

APPENDIX D - ANALYTICAL REPORTS

## I. INTRODUCTION

This review of groundwater monitoring data for a hazardous waste landfill site is prepared for submission to the EPA's Office of Solid Waste. Included in this document is a brief background information on the site and the waste, and the collection of analytical data on nearby ground and surface waters. These results are presented as a part of delisting petition # 0686.

The landfill cell is located in Ridgefield, Washington, and contains ash from the wood-fired boiler, which occasionally received chemical sludges for incineration. The original sludges are listed as K001 hazardous wastes. Because the ash resulted from burning K001 waste, it is also listed as a hazardous waste. The landfill site was formally closed in 1983, with the ash and other debris collected and packed into a clay-lined landfill cell. Analysis of the landfill's leachate has shown that it consistently contains levels of contaminants lower than those of an effluent that could be discharged without treatment. Therefore, the Pacific Wood Treating Corporation, owner and operator of the Ridgefield landfill site, is in the process of collecting data and preparing a petition to submit to the EPA to remove the site from hazardous waste regulation.

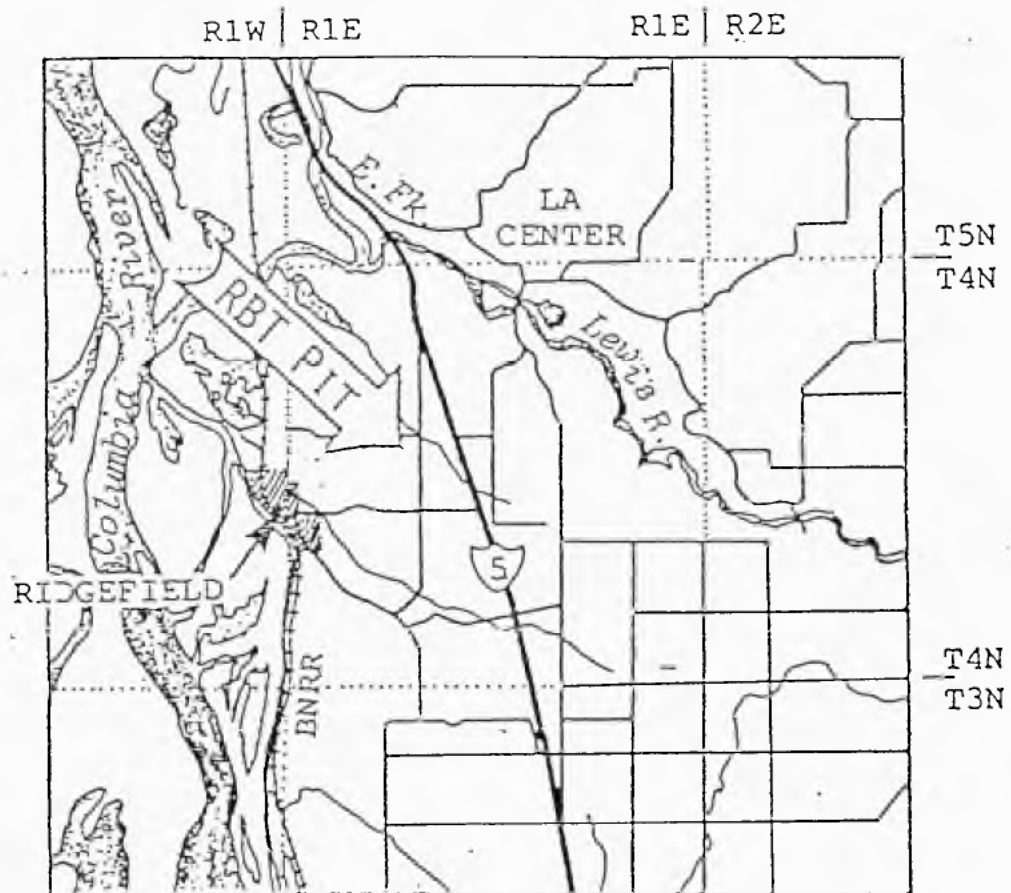
Ground and surface waters were studied at the site during the period it was operated as an unregulated unit, during closure activities and since partial closure activities have ended. This data spans a period of four years.

The site is located on 289th Street in Ridgefield, Washington, in the northwest quarter of the southeast quarter of Section 17 of Township 4N, range 1E, of the Willamette Meridian. A vicinity map is provided in Figure 1. The landfill cell location was originally a clay pit created by the prior owners' manufacture of brick and tile products. The original owner of the Ridgefield Brick and Tile site indicated that a clay layer 30 feet thick was removed, at which point a 3- to 4- foot layer of mica sand was encountered. The elevation of this pit area is approximately 200 feet MSL. Well logs from nearby homes indicate that the aquifer is located at 10- to 50-feet MSL(4).

The 5-1/2 acre site on the south side of 289th Street was originally owned and operated by Elmer Muffet of Ridgefield Brick and Tile (RBT). A 120' by 140' warehouse in the western half of the site housed the brick and tile manufacture facilities. Immediately east of the warehouse was the non-permitted dump area, and just south of this was the pit area, which would fill with water during the wetter months.

FIGURE 1

Vicinity Map



In 1979, the Pacific Wood Treating Corporation (PWT) began using the pit as a disposal site for log deck and yard cleanup waste, in addition to boiler ash. An estimated 5,000-10,000 cubic yards of material was deposited here during the extent of the site's use as a disposal area. The landfill contents included log deck and yard cleanup, incinerator, multiclone, and baghouse ashes, dusts, and clinkers, in addition to domestic trash such as wood, old fencing, stumps, and the like.

Pacific Wood Treating operates a wood preservation facility in Ridgefield, Washington. Wood is preserved with pentachlorophenol, creosote, or chrome-copper-arsenic solutions. Sludges from treatment of waste solutions are designated as K001 and D004 hazardous wastes. K001 waste is: "bottom sediment sludge from treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol". D004 wastes are those wastes which contain unacceptable levels of leachable arsenic. In the past, K001 wastewater sludges were regularly incinerated while CCA wastewater sludges would only be introduced to the incinerator by accident or system upset.

Exact records of sludge incineration were not kept, but some estimates of the total amounts of sludge burned can be made. PWT burned some 20 million pounds of wood per year in the boiler and, from 1979 to 1982, burned 32,000 pounds per year of waste sludges. Ash production for wood is approximately 3 percent, so the estimated total amount of ash from both wood and sludges is about 2.5 million pounds for the four year period. The ash had a density of approximately 1,000 pounds per cubic yard, amounting to an estimated 2,500 c.y. of ash generated by PWT in the four-year period from January, 1979, to December, 1982.

According to this data, the weight ratio of waste sludge to wood burned in the boiler was about 1:600. Therefore, the amount of ash in the landfill from hazardous waste incineration is probably about 5,000 pounds, or 5 c.y. of material. However, because the ash resulted from incineration of K001 or D004 waste with wood, the ash also carries a hazardous designation.

The incinerator was used for treatment of the hazardous waste sludges. This operation qualified the burner as a treatment, storage and disposal facility and a permit is necessary for this activity. During an inspection of PWT by the EPA and Washington State Department of Ecology in regard to approval for the incinerator process, it was discovered that PWT was disposing of the ash in an unapproved manner. PWT had inadvertently assumed that the ash was a non-regulated waste while, in fact, it had received the same hazardous waste designation as the original sludges. Therefore, PWT began formal closure proceedings on the landfill site.

The closure consisted of preliminary soil and water sampling, draining of the existing adjacent pond, excavating and constructing a clay liner at the former pond area, moving all accumulated wastes to the lined area, and covering the refuse with another clay layer. The existing pond was dried by sprinkling pond water on a small area of the pond at a low site and during dry weather so that it would evaporate and not run off. Two underdrain lines were placed in 2' X 2' trenches with 4-inch perforated pipe and washed gravel backfill in order to provide a positive drain below the waste. Preparation of the bottom liner consisted of removing soft surface soils from within the bottom of the existing clay borrow pit and compacting a soil base approximately 3 feet thick. A 4-inch thick soil-bentonite liner was built over the soil base. The liner was intended to contain leachate from the adjacent fill which was moved onto the improved area. The refuse was compacted into lifts and covered with an 18" compacted soil, covered by another 18" of topsoil. Drains were installed within the cell and just uphill of the cell. A wedge-shaped cell was constructed, approximately 180 feet square. The tall side of the cell is approximately 30 feet tall, and this tapers downhill to intersect with the bottom clay layer. French or toe drains were provided.

Groundwater monitoring in the form of lysimeters was provided in the design. Lysimeters monitor the unsaturated, or vadose, zone of groundwater. These were placed above the landfill to the southeast, and to the west, nearly directly south of the western corner of the buildings. These lysimeters sample the interstitial water in the mica sand unit just above the cemented gravel unit.

## II. PRELIMINARY GROUNDWATER STUDY

Before any closure activities began, a groundwater investigation was performed by registered geotechnical engineers and ground water hydrologists, Sweet Edwards and Associates. This study was performed during the summer of 1983. Their report is paraphrased here.

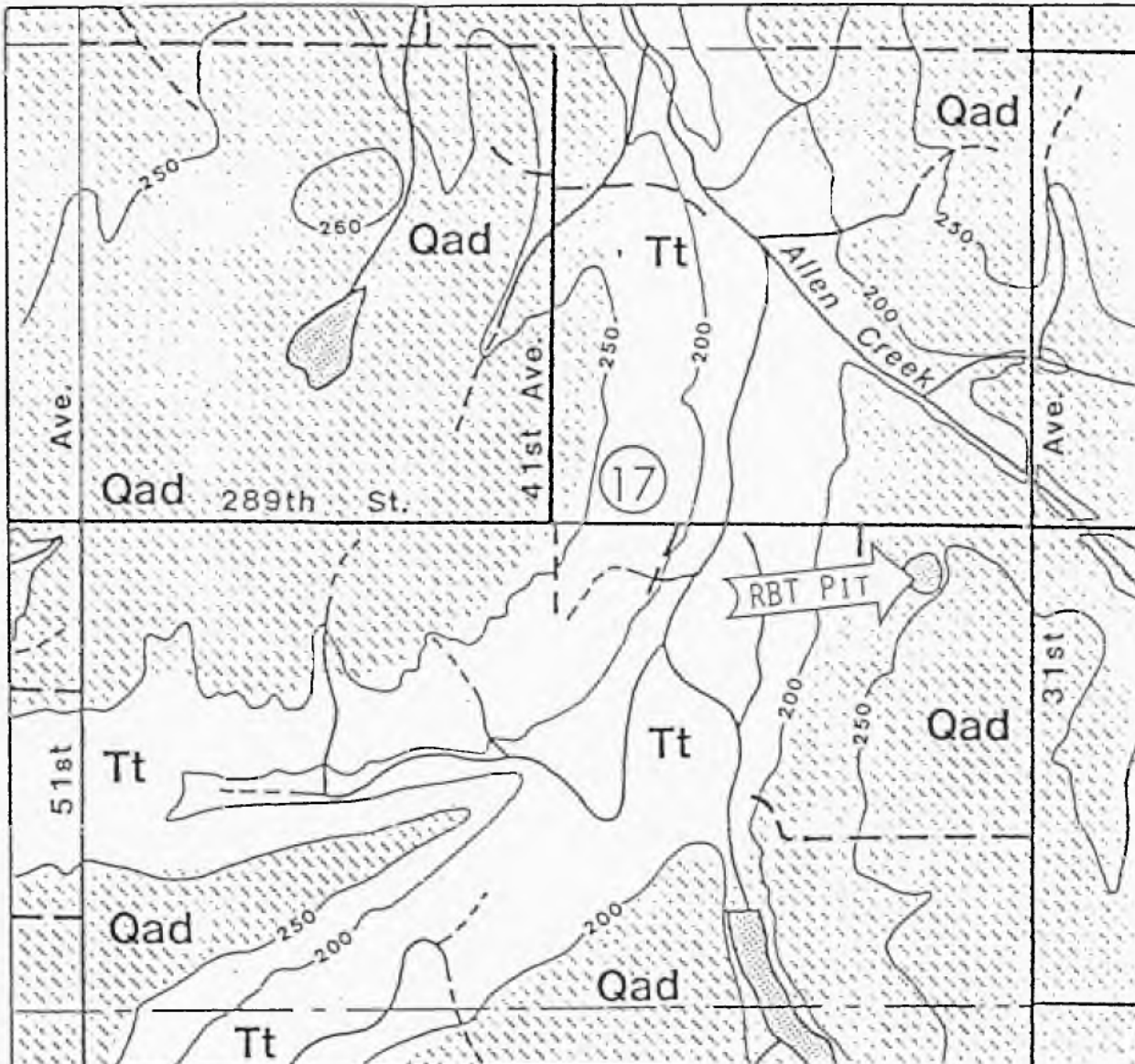
### A. HYDROGEOLOGY

The regional geology of Clark County has been described by The USGS (1964). The upland areas near the RBT site are reportedly underlain by Quarternary alluvial deposits including deltaic gravels, sands and silts. Underlying this unit is Tertiary Troutdale formation which is effectively ubiquitous to Clark County. The upper member of the Troutdale generally includes cemented sand and gravel while the lower member is predominately finer grained silts and clays. Mundorff (1964) maps the Troutdale as cropping out in the canyon west of the RBT as well as Allen Canyon to the north and northwest.

The RBT pit was excavated through up to 30 feet of clay (bottom elev. = 200 feet) before encountering 3 to 4 feet of mica sand. The mica sand unit to be underlain by cemented gravel. This appears to be consistent with the Mundorff (1964) interpretation in that the cemented gravel is considered to be the part of the Troutdale formation, see Figure 2 and 4 as well as well logs, in Appendix A.

A records search and field location of wells in the immediate vicinity of the RBT pit provided a more detailed picture of the local geology. Figure 3 shows the RBT pit as well as field located wells. Well logs, locator sheets and published data from Mundorff (1964) is appended. Figure 4 shows an east-west cross section paralleling 289th Street. Well logs indicate that the water producing zones of the aquifer are sand in this area. The elevation of these zones is about 10 to 50 feet MSL.

The irregular surface of the Troutdale, shown on Figure 4, indicates the deltaic unit unconformably overlies the Troutdale. The weathered surface of the Troutdale may result in locally perched ground water. This is supported by reports of sporadic success in obtaining small quantities of water from shallow dug wells. The ponding in the RBT pit also supports this interpretation. However, no productive shallow wells were located in the immediate area of the site.



Geologic contacts based on: USGS W.S.P. 1600, Plate 2

# EXPLANATION

- Qad** ALLUVIAL DEPOSITS-  
DELTAIC SAND AND GRAVEL,  
FINE SAND, AND SILT
- Tt** TROUTDALE FORMATION-  
UPPER MEMBER, SAND AND  
GRAVEL; LOWER MEMBER,  
SILT AND CLAY

Note: See Figure 3 for additional  
Explanation.

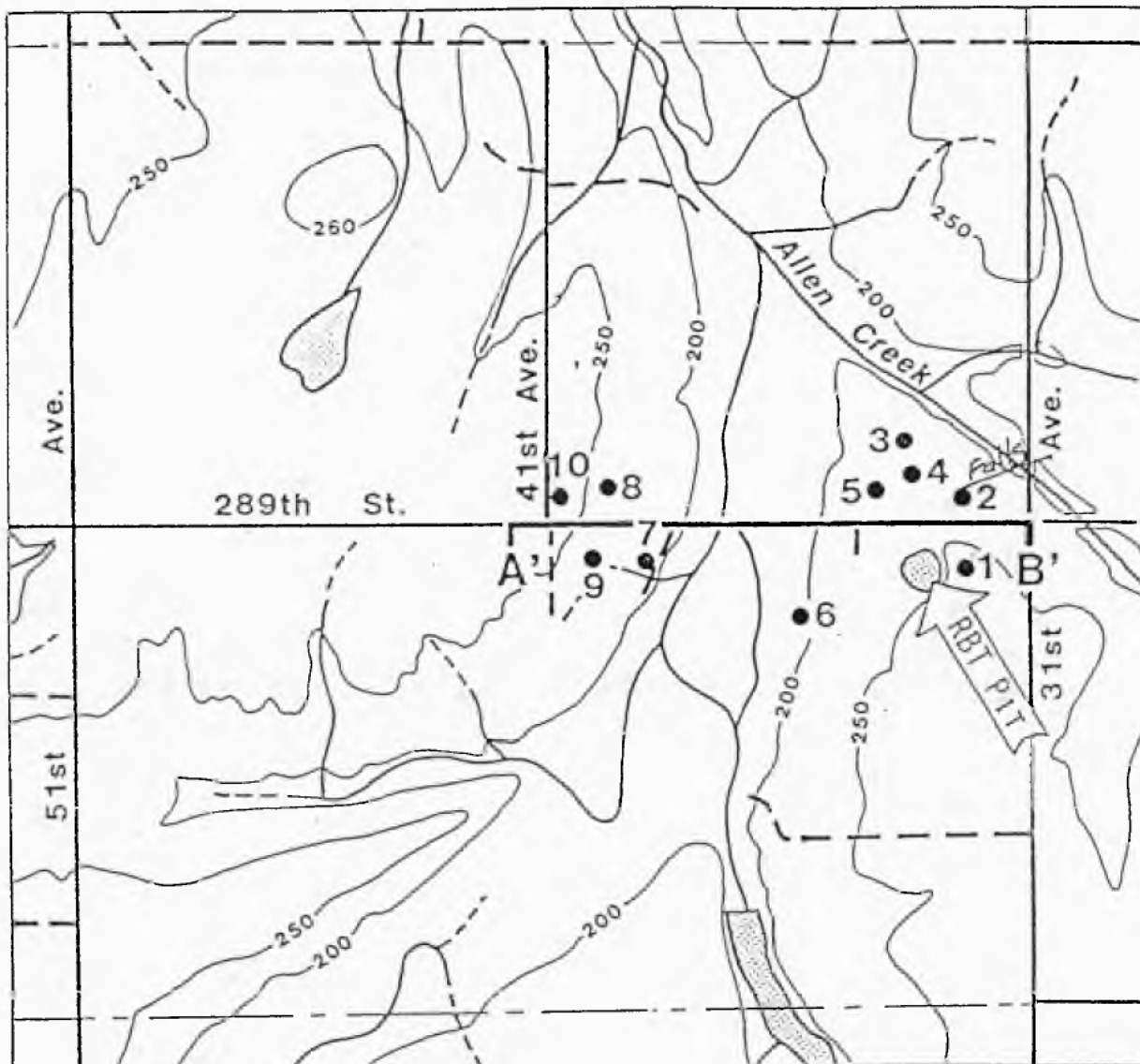


Scale: 1"=1000'

**RBT PIT**  
Geologic Map

FIGURE 2

Sweet, Edwards & Associates, Inc.



Base: Clark County Road Atlas-1982;  
USGS-Ridgefield 7.5' Quad.-1970;  
Clark County Aerial Photo-1978;  
and field data.



Scale; 1"=1000'

### EXPLANATION

- 1 WELL LOCATION
- 200 TOPOGRAPHIC CONTOURS (FT. ABOVE MSL)
- ROADS
- SURFACE WATER

LOCATION  
SECTION A'-B'

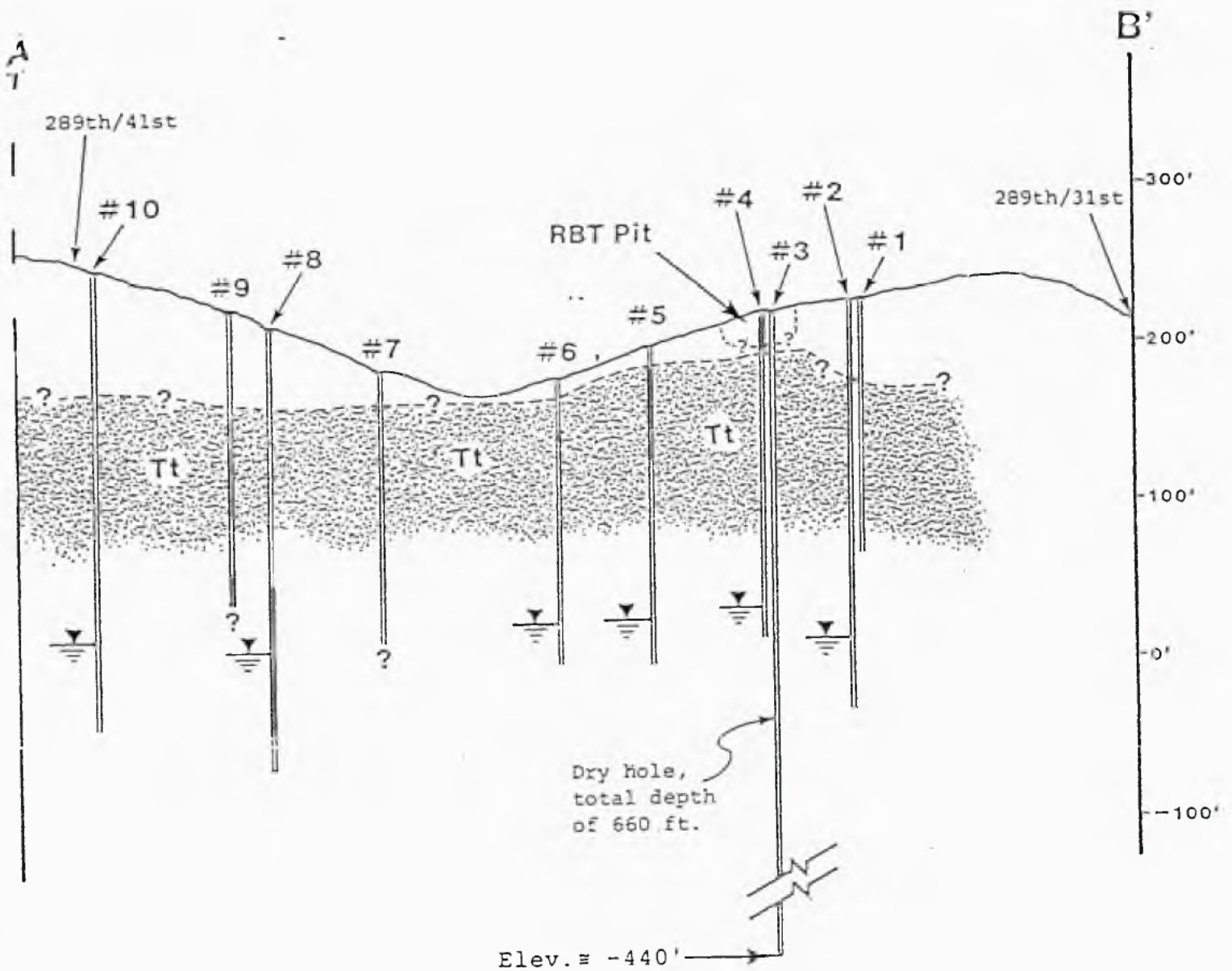
Note: See Figure 4 and  
appendix well data.



**RBT PIT**  
Topographic Map  
and  
Local Water Wells

FIGURE 3

Sweet, Edwards & Associates, Inc.



SCALE: HORIZONTAL @ 1" = 400'  
VERTICAL @ 1" = 100'

PROJECTED WELL LOCATIONS,  
DEPTHS AND REPORTED  
STATIC WATER LEVELS  
ALONG 289TH STREET,  
RIDGEFIELD, WASH.

## RBT Pit

Cross Section

FIGURE 4

Sweet, Edwards & Associates, Inc.



Water Supply Paper 1600 has shown the general direction of ground water flow in the Troutdale aquifer to be from the southeast toward the northwest, see Figure 5. The aquifer has relatively high transmissive capabilities ranging from estimates of 800 to 6,000 gal/day/ft in the vicinity of the site. Assuming an effective thickness of 24 to 42 feet and a specific yield of 20 percent, the local pore or seepage velocity of underflow is calculated to range from about 0.2 to 1.6 ft/day from the southeast toward the northwest.

The local beneficial use of the aquifer is limited to domestic and agricultural supplies to wells. Wells located immediately downgradient are shown on Figure 3.

#### B. WATER QUALITY

Ambient quality in the Troutdale aquifer is generally good with regard to the primary drinking water standards and as summarized by Mundorff (1964). Some secondary constituents, most notably iron, locally approach or exceed recommended levels for drinking water. For example, the owner of well No. 6 complained of iron in the well water and well No. 7 had noticeable iron precipitation around the casing and plumbing fixtures.

Field sampling of the ponded water adjacent to the materials deposited at RBT as well as 5 nearby wells was carried out May 31, 1983. The pond water sample was taken at the face of the fill. It was noteworthy that fish, tadpoles and frogs were observed in the pond during that sampling. Well samples were collected at spigots closest to the well head but in most cases, i.e. all except well No. 6, sample residence time in water lines and/or pressure tanks could not be avoided. The sampling was not in strict compliance with Sweet-Edwards QA/QC procedures but does provide an indicator of potential health hazards to the water users. Results of the tests run by PWT at their Ridgefield laboratory are included in Table 1.

Only the pond had arsenic and pentachlorophenol (PCP) concentrations above the detection limit. However, the arsenic level is well below the primary drinking water standard of 50 ug/l. Both the pond and well No. 2 exceeded the detection limit for PCP. However, the accuracy and retraceability of both the samples and the analytical procedures is not high, and accordingly, these results are somewhat de-emphasized.



Base: USGS W.S.P. 1600, Plate 3



# EXPLANATION

- <sub>EI</sub> REPRESENTATIVE WELL
- 100— PRINCIPAL GROUND WATER CONTOUR
- 50— INTERMEDIATE GROUND WATER CONTOUR



**RBT PIT**  
Ground Water Contour  
and  
Well Location Map

FIGURE 5

Sweet, Edwards & Associates, Inc.

Two well samples, Nos. 4 and background, exceed the primary drinking water standard of 50 ug/l for chromium. Given the location of the wells and the lack of other "high" levels of waste material constituents, these are considered to be artifacts of the plumbing system or lab variance. Similarly, the copper concentration noted for well No. 7 was above the testing detection limit, but below the secondary drinking water standard of 100 ug/l. This well is some distance from the spigot sampled at the house and copper plumbing in this renew home may be the source of the contamination.

The results of this preliminary groundwater investigation, performed by Sweet Edwards in 1983, show levels of phenols, PCP, and metals at or below the analytical detection limits. When results indicate a detectable amount of a constituent, it's concentration is very close to the detection limit of the analytical method used at that time. The results therefore may not be significant or accurate.

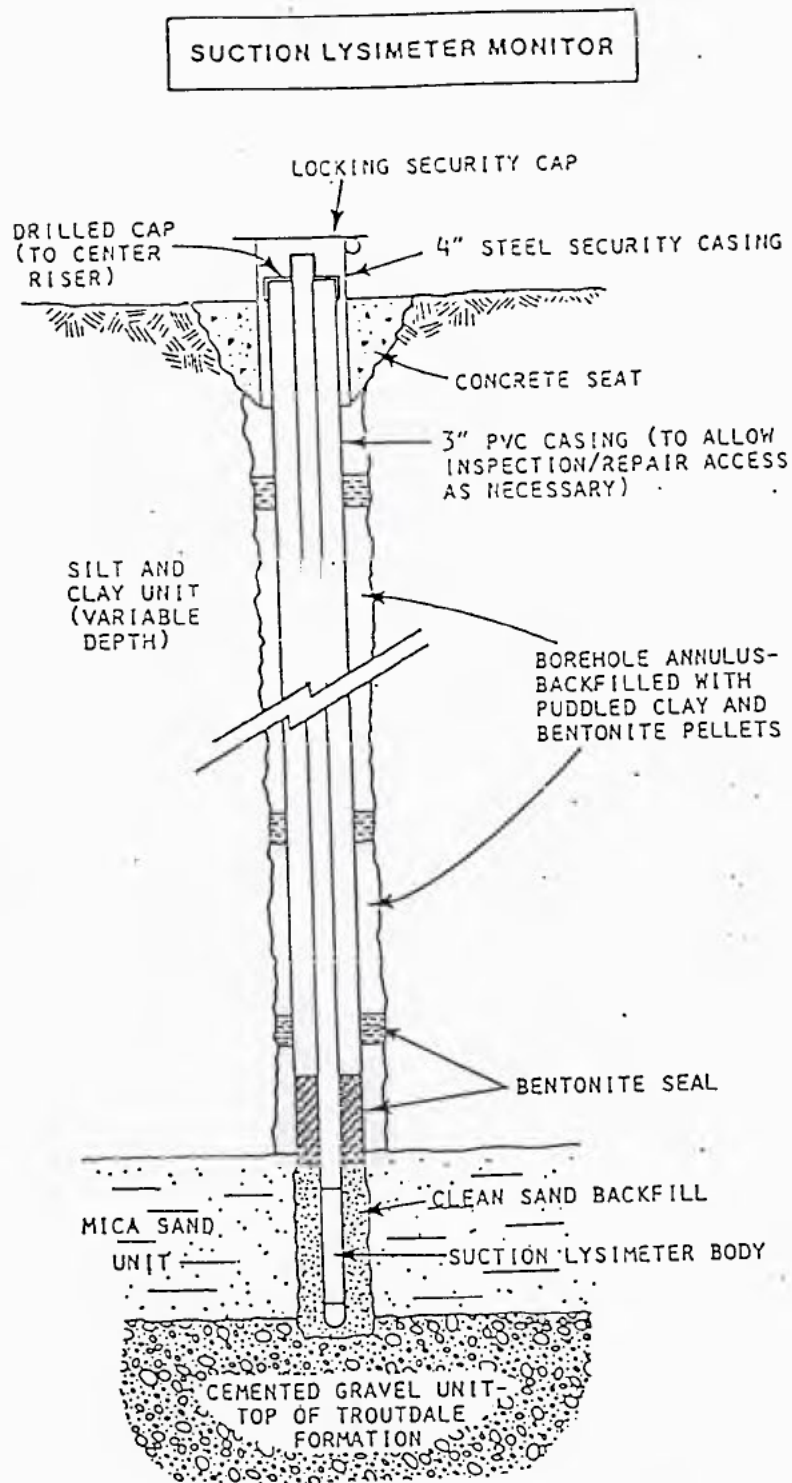
### III. GROUNDWATER MONITORING

#### A. VADOSE ZONE MONITORING PLAN

As a part of the initial closure plan for the site in 1983, unsaturated zone ground water monitoring was proposed.

Based on a moisture balance developed for the fill, the descriptions of the saturated and unsaturated zones, and the proximity of the facility to existing or potential water supplies and surface water, the ground water monitoring program for post-closure implementation was developed. The plan focused on the uppermost saturated zone, perched ground water above the cemented gravel unit and generally reported in the mica sand unit below the silt and clay. Although it may be only seasonally saturated, monitoring moisture movement in this unit will provide the earliest possible warning of any significant contaminant movement.

There was a background lysimeter installed in the northeast corner of the property, and two additional lysimeters located further to the west. The toe drain/collector at the edge of the waste provides an additional down-gradient data point. It was expected that suction lysimeters would require periodic replacement due to clogging or damage. The lysimeter would be removed, inspected and repaired or replaced as necessary to comply with the design indicated in Figure 6.



"FIGURE 6"

Actual locations and drill logs from lysimeter installation around the landfill are shown in Appendix B. Additional test pit and borehole information is provided in Appendix C.

#### B. SUMMARY OF GROUNDWATER INVENTORY DATA

Since the site was closed in the fall of 1983, nearby wells, the toe and underdrain lines and lysimeters have been sampled and analyzed for indications of contamination from the RBT ash. These results are summarized in Table 2. Copies of the original laboratory reports are included in Appendix D. Well numbers are those indicated in Figure 3. Lysimeter numbers are located in the layout map in Appendix B.

The summary of the groundwater analyses shows a few notable results. The blank run performed on 12-17-85 showed a very high concentration of copper, while well and drain waters had no detectable copper. This indicates that at the detection levels for this study, lab variance and other factors become very important. Because all the results are so close to the laboratory's analytical detection limits, the reliability and accuracy of results are not always great.

Toe drain leachate typically, and logically, shows higher levels of contaminants than nearby well and lysimeter waters. One lysimeter test results for #3 on 6-15-84, showed a PCP concentration of almost 10ppb. This location, as indicated in Appendix B, is adjacent to the former dump site where the ash was deposited in an unregulated manner. Some of these results may indicate contamination from previous activity. Even so, the levels of PCP found in various groundwaters are significantly lower than the recommended drinking water standard for PCP at 200ppb. (Federal Register Vol 50, no.219, Wednesday, November 13, 1985, page 47003)

In summary, the groundwater data area unremarkable in that the levels of contamination found in the area are so low as to be not detectable. In consideration of the history of the site and the unregulated nature of it's early use, the water in the area, both shallow and deep, is relatively uncontaminated.

TABLE 2  
RESULTS OF GROUNDWATER ANALYSES  
for  
Wells, Drains and Lysimeters  
Near the  
RBT Landfill  
Analysis\*\*

SAMPLE DATE	SAMPLE LOCATION	TOTAL PHENOLS ppm	PCP ppb	NAPHTHA- LENE ppb	Cu ppm	Cr ppm	As ppm	Cd ppm	Pb ppm	Hg ppm	Ba ppm	Se ppm	Ag ppm
12-20-83	Lysimeter 1	ND	< 0.1	ND	.005	.006	< .005	< .002	ND	ND	ND	ND	ND
	Lysimeter 3	ND	< 0.53	ND	< .005	.006	< .005	< .002	ND	ND	ND	ND	ND
	Well 4	ND	< .01	< 1	.013	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01
	Upgradient Well	ND	< .01	< 1	< .005	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01
	Toe Drain	ND	0.56	10	< .005	< .01	.009	< .002	< .01	< .001	0.1	< .005	< .01
01-10-84	Toe Drain*	ND	< 10	.17	< .02	< .02	.001	< .01	.08	< .2ppb	.15	< .001	< .02
	Well 2*	ND	< 10	< .06	.05	< .02	.004	< .01	.04	< .2ppb	.08	.002	< .02
	Well 5*	ND	< 10	< .06	< .02	< .02	.002	< .01	.10	< .2ppb	.08	< 1ppb	< .02

\* Analysis performed by Washington State Department of Ecology  
\*\* Results in ppm or mg/l unless otherwise stated

ND=Not Determined

TABLE 2 (Continued)

SAMPLE DATE	SAMPLE LOCATION	TOTAL PHENOLS ppm	PCP ppb	NAPHTHA- LENE ppb	Cu ppm	Cr ppm	As ppm	Cd ppm	Pb ppm	Hg ppm	Ba ppm	Se ppm	Ag ppm
01-11-84	Toe Drain	ND	1.27	5	< .005	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01
	Well 2	ND	< .01	< 1	.050	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01
	Well 5	ND	< .01	< 1	< .005	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01
03-26-84	Well 4	ND	< .1	< 5	< .005	< .005	< .005	< .002	< .005	< .001	< .1	< .005	< .01
	Well 5	ND	< .1	< 5	< .005	< .005	< .005	< .002	< .005	< .001	.0.1	< .005	< .01
	Upgradient Well	ND	< .1	< 5	< .005	< .005	< .005	< .002	< .005	< .001	< .1	< .005	< .01
	Well 2	ND	< .1	< 5	.022	< .005	.014	< .002	< .005	< .001	.0.1	< .005	< .01
	Toe Drain	ND	2.7	< 5	< .005	< .005	.008	< .002	< .005	< .001	.0.1	< .005	< .01
	Lysimeter 1	ND	1.4	< 5	0.005	< .005	< .005	.002	< .005	< .001	< .1	< .005	< .01
	Lysimeter 2	ND	< .1	< 5	.005	< .005	< .005	< .002	< .005	< .001	.0.1	< .005	< .01
	Lysimeter 3	ND	.3	< 5	.005	< .005	< .005	< .002	< .005	ND	< .1	< .005	< .01
06-15-84	Well 2	< .005	.86	< .1	.005	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01
	Well 5	.013	.43	< .1	< .005	< .01	< .005	< .002	< .01	< .005	< .1	< .005	< .01
	Well 4	< .005	.13	< .1	< .005	< .01	< .005	< .002	< .01	< .005	< .1	< .005	< .01
	Upgradient Well	< .005	1.1	< .1	.006	< .01	< .005	< .002	< .01	< .005	< .1	< .005	< .01
	Lysimeter 1	ND	< .1	50	ND	ND	< .005	ND	ND	ND	ND	ND	ND
	Lysimeter 2	ND	1.9	50	ND	ND	< .005	ND	ND	ND	ND	ND	ND

TABLE 2 (Continued)

SAMPLE DATE	SAMPLE LOCATION	TOTAL PHENOLS ppm	PCP ppb	NAPHTHA- LENE ppb	Cu ppm	Cr ppm	As ppm	Cd ppm	Pb ppm	Hg ppm	Ba ppm	Se ppm	Ag ppm
09-14-84	Lysimeter 3	ND	9.8	< 50	ND	ND	.005	ND	ND	ND	ND	ND	ND
	Lysimeter 1	ND	0.1	< 1	ND	ND	.005	ND	< .01	ND	ND	< .005	ND
	Lysimeter 2	ND	< .1	2	.048	< .01	.005	< .002	< .01	.01	< .1	< .005	< .01
	Well 2	< .005	< .1	< 1	.008	< .01	.005	< .002	< .01	< .001	< .1	< .005	< .01
	Well 4	< .005	< .1	< 1	< .005	< .01	.005	< .002	< .01	< .001	< .1	< .005	< .01
	Well 5	< .005	< .1	< 1	< .005	< .01	.005	< .002	< .01	< .001	< .1	< .005	< .01
	Upgradient Well	< .005	< .1	< 1	.012	< .01	.005	< .002	< .01	< .001	< .1	< .005	< .01
12-17-85	Toe Drain	< .005	< .1	< 1	< .005	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01
	Blank	< .005	< .75	< 1	.011	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01
	Well 5	< .005	< .75	< 1	< .005	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01
	Toe Drain	.035	< .75	< 1	< .005	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01
	Underdrain	< .005	< .75	< 1	< .005	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01
12-24-85	Upgradient Well	.032	< .75	< 1	.13	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01
	Well 4	< .005	< .75	< 1	< .005	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01
	Well 2	< .005	< .75	< 1	.008	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01

TABLE 2 (Continued)

SAMPLE DATE	SAMPLE LOCATION ppm	TOTAL PHENOLS	PCP ppb ppb	NAPHTHA- LENE	Cu ppm	Cr ppm	As ppm	Cd ppm	Pb ppm	Hg ppm	Ba ppm	Se ppm	Ag ppm
04-17-86	Well 1	< .005	< .75	< 1	< .005	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01
	Well 6	< .005	< .75	< 1	< .005	< .01	< .005	< .002	< .01	< .001	< .1	< .005	< .01
	Underdrain	.01	< 1	1.4	< .005	< .01	< .005	< .002	< .01	.001	< .1	< .005	< .01
	Toe Drain Sump	.02	1.14	4.9	.02	< .01	< .005	< .002	< .01	.001	< .1	< .005	< .01
	Toe Drain Distrib. Box	.043	< 1	6.1	.006	< .01	0.005	< .002	< .01	.001	0.1	< .005	< .01
12-24-86	Well 5	.054	< 1	.67	< .002	< .005	< .005	< .002	< .01	.001	.06	< .005	< .002
	Toe Drain	.040	< 1	.45	< .002	< .005	< .005	< .002	< .01	.001	.05	< .005	< .002
	Well	< .005	< 1	.61	< .002	< .005	< .005	< .002	< .01	.001	< .01	< .005	< .002

APPENDIX A  
WELL LOGS

SWEET, EDWARDS & ASSOCIATES, INC.  
WELL DATA

No. 2

Project Pacific Wood

(b) (6)  
State No. 4N/1E-17 add  
Other No. \_\_\_\_\_  
Address \_\_\_\_\_  
County \_\_\_\_\_  
Basin \_\_\_\_\_  
U.S.G.S. Quad. \_\_\_\_\_  
Section 17 Twp. 4N Rge. 1E Will. Meridian  
Description Unable to locate log or contact owner

Reference Point description \_\_\_\_\_  
which is \_\_\_\_\_ ft. above land surface. Ground Elevation 230 ft.  
Reference Point Elev. \_\_\_\_\_ ft. Determined from \_\_\_\_\_  
Well: Use \_\_\_\_\_ Condition \_\_\_\_\_ Depth \_\_\_\_\_ ft.  
Casing, size \_\_\_\_\_ In., perforations \_\_\_\_\_

Measurements By: DWR ☐ USGS ☐ USBR ☐ County ☐ Irr. Dist. ☐ Water Dist. ☐ Cons. Dist. ☐ Other ☐  
Chief Aquifer: Name \_\_\_\_\_ Depth to Top Aq. \_\_\_\_\_ Depth to Bot. Aq. \_\_\_\_\_  
Type of Material \_\_\_\_\_ Perm. Rating \_\_\_\_\_ Thickness \_\_\_\_\_  
Gravel Packed? Yes ☐ No ☐ Depth to Top Gr. \_\_\_\_\_ Depth to Bot. Gr. \_\_\_\_\_  
Upper Aquifer \_\_\_\_\_ Depth to Top Aq. \_\_\_\_\_ Depth to Bot. Aq. \_\_\_\_\_  
Driller No log on file  
Date drilled \_\_\_\_\_ Log, filed \_\_\_\_\_ open (1) \_\_\_\_\_ confidential (2) \_\_\_\_\_  
Equipment: Pump, type \_\_\_\_\_ make \_\_\_\_\_  
Serial No. \_\_\_\_\_ Size of discharge pipe \_\_\_\_\_ In.  
Power, Kind: \_\_\_\_\_ Make \_\_\_\_\_  
H. P. \_\_\_\_\_ Motor Serial No. \_\_\_\_\_  
Elec. Meter No. \_\_\_\_\_ Transformer No. \_\_\_\_\_  
Yield \_\_\_\_\_ G.P.M. Pumping level \_\_\_\_\_ ft.  
Water Analysts: Min. (1) \_\_\_\_\_ Son. (2) \_\_\_\_\_ H.M. (3) \_\_\_\_\_  
Water Levels available: Yes (1) \_\_\_\_\_ No \_\_\_\_\_  
Period of Record: Begin \_\_\_\_\_ End \_\_\_\_\_  
Collecting Agency: \_\_\_\_\_  
Prod. Rec. (1) \_\_\_\_\_ Pump Test (2) \_\_\_\_\_ Yield (3) \_\_\_\_\_

SKETCH



(b) (6)

(b) (6)

⊗ Pump house

REMARKS

Not measured or sampled

Recorded by: HRS

# SWEET, EDWARDS & ASSOCIATES, INC.

## WELL DATA

No. 2

Project Pacific Wood

Owner (b) (6) State No. AN/IE - 17 d2b  
 Address 6 Ground, WA 98604 Other No. \_\_\_\_\_  
 Tenant \_\_\_\_\_  
 Address \_\_\_\_\_

Type of Wells: Hydrograph ☒ Key ☐ Index ☐ Semiannual ☐ Quality ☒  
 Location: County Clark Basin \_\_\_\_\_ No. \_\_\_\_\_  
 U.S.G.S. Quad. R. Deepfield Quad. No. \_\_\_\_\_  
NE  $\frac{1}{4}$  SE  $\frac{1}{4}$  Section 17, Twp. 4N, Rge. 1E Will. Meridian

Description \_\_\_\_\_

Reference Point description \_\_\_\_\_

which is 1 ft. <sup>above</sup> land surface. Ground Elevation 203 ft.

Reference Point Elev. \_\_\_\_\_ ft. Determined from \_\_\_\_\_

Well: Use Domestic Condition Good Depth 260 ft.

Casing, size 6 in., perforations \_\_\_\_\_

Measurements By: DWR ☐ USGS ☐ USBR ☐ County ☐ Irr. Dist. ☐ Water Dist. ☐ Cons. Dist. ☐ Other ☒

Chief Aquifer: Name SEE LOG Depth to Top Aq. \_\_\_\_\_ Depth to Bot. Aq. \_\_\_\_\_

Type of Material \_\_\_\_\_ Perm. Rating \_\_\_\_\_ Thickness \_\_\_\_\_

Gravel Packed? Yes ☐ No ☐ Depth to Top Gr. \_\_\_\_\_ Depth to Bot. Gr. \_\_\_\_\_

Supp. Aquifer \_\_\_\_\_ Depth to Top Aq. \_\_\_\_\_ Depth to Bot. Aq. \_\_\_\_\_

Driller SEE LOG

Date drilled \_\_\_\_\_ Log filed \_\_\_\_\_ open (1) \_\_\_\_\_ confidential (2) \_\_\_\_\_

Equipment: Pump, type Submersible make \_\_\_\_\_

Serial No. \_\_\_\_\_ Size of discharge pipe \_\_\_\_\_ in.

Power, Kind: \_\_\_\_\_ Make \_\_\_\_\_

H. P. \_\_\_\_\_ Motor Serial No. \_\_\_\_\_

Elec. Meter No. \_\_\_\_\_ Transformer No. \_\_\_\_\_

Yield \_\_\_\_\_ G.P.M. Pumping level \_\_\_\_\_ ft.

Water Analysis: Min. (1) \_\_\_\_\_ San. (2) \_\_\_\_\_ H.M. (3) \_\_\_\_\_

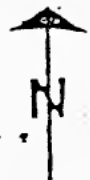
Water Levels available: Yes (1) \_\_\_\_\_ No \_\_\_\_\_

Period of Record: Begin \_\_\_\_\_ End \_\_\_\_\_

Collecting Agency: \_\_\_\_\_

Prod. Rec. (1) \_\_\_\_\_ Pump Test (2) \_\_\_\_\_ Yield (3) \_\_\_\_\_

SKETCH



(b) (6)

REMARKS

Well located (b) (6)

(b) (6)

Sampling from nearest spigot located behind garage to the west of house.

Recorded by: HR-S

(b) (6)

OWNER: Name: \_\_\_\_\_

Address: \_\_\_\_\_

LOCATION OF WELL: County ClarkSec. 17 T. 4 N. R. 1 E W.M.

Distance from section or subdivision corner: \_\_\_\_\_

PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐  
Irrigation ☐ Test Well ☐ Other ☐TYPE OF WORK: Owner's number of well \_\_\_\_\_  
(if more than one) \_\_\_\_\_  
New well ☐ Method: Dug ☐ Bored ☐  
Deepened ☐ Cable ☒ Driven ☐  
Reconditioned ☐ Rotary ☐ Jetted ☐DIMENSIONS: Diameter of well 6 inches.  
Depth of completed well 260 ft.

## CONSTRUCTION DETAILS:

Piping installed: 6" Diam. from 0 ft. to 248 ft.  
Threaded ☐ 510" Diam. from 253 ft. to 260 ft.  
Welded ☒ \_\_\_\_\_" Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.Perforations: Yes ☐ No ☒Type of perforator used: \_\_\_\_\_  
SIZE of perforations \_\_\_\_\_ in. by \_\_\_\_\_ in.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.Screens: Yes ☒ No ☐Manufacturer's Name JO2 Johnson  
Type stainless steel Model No. \_\_\_\_\_  
Diam. 6" Slot size 15 from 248 ft. to 253 ft.  
Diam. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.Gravel packed: Yes ☐ No ☒ Size of gravel: \_\_\_\_\_  
Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.Surface seal: Yes ☐ No ☐ To what depth? 20 ft.  
Material used in seal clay & Bentonite  
Did any strata contain unusable water? Yes ☐ No ☒  
Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
Method of sealing strata off \_\_\_\_\_PUMP: Manufacturer's Name \_\_\_\_\_  
Type: \_\_\_\_\_ HPWATER LEVELS: Land-surface elevation \_\_\_\_\_  
above mean sea level. \_\_\_\_\_  
level 215 ft. below top of well Date 5-30-72Pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_  
Artesian water is controlled by \_\_\_\_\_  
(Cap. valve, etc.)WELL TESTS: Drawdown is amount water level is lowered below static level  
Pump test made? Yes ☐ No ☒ If yes, by whom? \_\_\_\_\_  
gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Data (time taken as zero when pump turned off) (water level used from well top to water level)

Time	Water Level	Time	Water Level
_____	_____	_____	_____
_____	_____	_____	_____

Flow of test \_\_\_\_\_ gal./min. with 7 ft. drawdown after 1 hrs.Flow \_\_\_\_\_ g.p.m. Date \_\_\_\_\_  
Temperature of water \_\_\_\_\_ Was a chemical analysis made? Yes ☐ No ☒

## (10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
lug well	0	5
brown clay	5	12
sandy brown clay	12	49
cemented sand & gravel	49	72
hard cemented gravel	72	137
light brown sandy clay	137	159
brown dry sand	159	205
brown sand & gravel	205	218
loose brown sand & water	218	252
fine sand & water	252	260

Work started 5-19 1972 Completed 5-30 1972

## WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Hansen Drilling Co., Inc.  
(Person, firm, or corporation) (Type or print)Address 6711 N.E. 53th Ave. Vancouver, Wa.[Signed] Mistrett Johnson  
(Well Driller) Km HansenLicense No. 223-02-1155 Date June 1 1972

# SWEET, EDWARDS & ASSOCIATES, INC.

## WELL DATA

No. 3, 4, 5

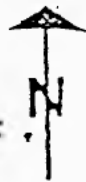
Project Pacific Wood

Owner (b) (6) State No. 4N/1E-172d  
 Address \_\_\_\_\_ Other No. \_\_\_\_\_  
 Tenant \_\_\_\_\_  
 Address \_\_\_\_\_  
 Type of Well: Hydrograph ☒ Key ☐ Index ☒ Semiannual ☐ Quality ☒  
 Location: County Clark Basin \_\_\_\_\_ No. \_\_\_\_\_  
 U.S.G.S. Quad. Kiderland Quad. No. \_\_\_\_\_  
 SE 1/4 NW 1/4 Section 17, Twp. 4N, Rge. 1E Will. Meridian  
 Description well logs from USGS, Water Supply Paper 1000 attached.

Reference Point description \_\_\_\_\_  
 which is 0.5 ft. above land surface. Ground Elevation #384 = 223 ft #5 = 200 ft  
 Reference Point Elev. \_\_\_\_\_ ft. Determined from Quad sheet  
 Well: Use domestic Condition \_\_\_\_\_ Depth \_\_\_\_\_ ft.  
 Casing, size 6 in In., perforations \_\_\_\_\_

Measurements By: DWR ☐ USGS ☐ USBR ☐ County ☐ Irr. Dist. ☐ Water Dist. ☐ Cons. Dist. ☐ Other ☐  
 Chief Aquifer: Name Troutdale Depth to Top Aq. see logs Depth to Bot. Aq. \_\_\_\_\_  
 Type of Material \_\_\_\_\_ Perm. Rating \_\_\_\_\_ Thickness \_\_\_\_\_  
 Gravel Packed? Yes ☐ No ☐ Depth to Top Gr. \_\_\_\_\_ Depth to Bot. Gr. \_\_\_\_\_  
 Supp. Aquifer \_\_\_\_\_ Depth to Top Aq. \_\_\_\_\_ Depth to Bot. Aq. \_\_\_\_\_  
 Driller K.J. Strasser for #4 E = 5  
 Date drilled \_\_\_\_\_ Log, filed \_\_\_\_\_ open (1) confidential (2) \_\_\_\_\_  
 Equipment Pump, type \_\_\_\_\_ make \_\_\_\_\_  
 Jarol No. \_\_\_\_\_ Size of discharge pipe \_\_\_\_\_ in.  
 Power, Kind \_\_\_\_\_ Make \_\_\_\_\_  
 H. P. \_\_\_\_\_ Motor Serial No. \_\_\_\_\_  
 Elec. Meter No. \_\_\_\_\_ Transformer No. \_\_\_\_\_  
 Yield \_\_\_\_\_ G.P.M. Pumping level \_\_\_\_\_ ft.

SKETCH



(H<sub>1</sub>) abandoned = 3  
 (H<sub>2</sub>) = 4  
 (H<sub>3</sub>) = 5  
 0#2  
 0#1

REMARKS

#3 abandoned

#4 spigot at shed south of pump house.

#5 spigot at west end of pump house

(b) (6)

(b) (6)

Recorded by: ARS

scale 1" = 400'

TABLE 17.—Materials penetrated by representative wells—Continued

Materials	Thick- ness (feet)	Depth (feet)	Materials	Thick- ness (feet)	Depth (feet)
4/1-16D1					
(R. Weston, West Pioneer. At intersection of U.S. Highway 94 and County Road 25. Altitude about 265 ft. Drilled by R. J. Strasser. Casing, 8-in. to 277 ft; perforated and gravel-packed from 256 to 270 ft.)					
Pleistocene alluvial deposits:			Troutdale formation—Con.		
Clay, yellow, and topsoil.....	55	55	Upper member—Con.	35	215
Troutdale formation:			Gravel, loose, dry.....	41	256
Upper member:			Lower member:		
Gravel, cemented.....	53	136	Sand, dry.....	14	270
Sand.....	3	141	Sand, water-bearing.....	7	277
Gravel, cemented.....	29	180	Sand, dry, hard.....		
4/1-17H1					
(C. B. Modest. About 2 miles northeast of Ridgefield and 0.1 mile west of intersection of County Roads 21 and 23. Altitude about 225 ft. Drilled by R. A. Jakes. Casing, 8-in. to 430 ft, 5-in. to 600 ft.)					
Troutdale formation:			Troutdale formation—Con.		
Upper member:	30	30	Lower member:		
Clay.....	100	130	Sand, coarse, yellow.....	90	210
Gravel, cemented.....			Sand (quicksand), fine.....	450	600
4/1-17H2					
(C. B. Modest. About 2 miles northeast of Ridgefield and 0.1 mile west of intersection of County Roads 21 and 23. Altitude about 225 ft. Drilled by R. J. Strasser. Casing, 8-in. to 200 ft.)					
Troutdale formation:			Troutdale formation—Con.		
Upper member:			Lower member:		
Topsoil.....	2	2	Clay, blue and yellow.....	53	100
Clay, yellow.....	26	28	Sand, water-bearing.....	19	200
Conglomerate.....	79	107			
4/1-17H3					
(C. B. Modest. About 2 miles northeast of Ridgefield and 0.1 mile west of intersection of County Roads 21 and 23. Altitude about 200 ft. Drilled by R. J. Strasser. Casing, 12-in. to 200 ft.)					
Troutdale formation:			Troutdale formation—Con.		
Upper member:			Upper member—Con.		
Topsoil.....	2	2	Conglomerate.....	75	87
Clay, yellow.....	10	12	Lower member:		
			Clay, blue and yellow.....	86	173
			Sand, water-bearing.....	27	200
4/1-19E3					
(Town of Ridgefield. Altitude about 35 ft. Drilled by R. J. Strasser, 1933. Casing, 10-in. to 61 ft; perforated)					
Recent alluvium:			Troutdale formation—Con.		
Surface topsoil.....	6	6	Gravel, cemented.....	8	50
Boulders.....	4	10	Sand, and gravel, water-bearing.....	6	56
Troutdale formation:			Gravel, cemented.....	9	65
Gravel, cemented.....	26	36			
Gravel, water-bearing.....	6	42			
4/1-19R1					
(A. F. Frewing. About 1.1 miles southeast of Ridgefield. Altitude about 240 ft. Drilled by Hansen Drilling Co., 1933. Casing, 8-in. to 150 ft.)					
Pleistocene alluvial deposits:			Troutdale formation:		
Topsoil.....	3	3	Gravel, cemented.....	65	145
Clay and sand.....	14	17	Gravel and sand, water-bearing.....	5	150
Clay, blue.....	8	25			
Clay, yellow.....	55	80			

TABLE 15.—Records of representative wells in Clark County, Wash.—Continued

Well	Owner or tenant	Topog- ra- phy	Altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone			Water level		Pump		Use	Remarks
								Depth to top (feet)	Thick- ness (feet)	Character of material	Depth	Date	Type	H.P.		
T. 4 N., R. 1 E.— Con.																
16P1	T. Richards.....	Up	280	Dg	21	30				Sand.....	13.2	9-9-49	J	3/4	D	
16P1	O. O. Pittman.....	Up	286	Dr	300	6				do.....	230		P	2	D	
16C1	A. W. Sundvick.....	Up	272	Dr	274	6	274	268	14	do.....	260		P	1 1/2	D	Cp. L.
16D1	H. Weston.....	Up	266	Dr	277	6	277	266	14	do.....	260		P	3/4	D	L.
16H1	B. D. Zimmerly.....	Up	280	Dr	630	6-8	630			do.....	190		P	1	D	Cp.
16Q1	E. Herdt.....	Up	270	Dg	30	48				do.....	12		O	3/4	D	
17E1	M. Starkey.....	Up	200	Dg	17					(Gravel.....	15.6	9-9-49	P	3/4	D	
17U1	C. B. Moffett.....	8	225	Dr	600	6-8	600			do.....			N		NU	No water reported. L.
17H2	do.....	8	225	Dr	209	6	209	190	19	Sand.....	194		P		D	Pumped 30 gpm. L.
17H3	do.....	8	200	Dr	200	12-6	200	173	27	do.....	173		P	6	D	Pumped 30 gpm. Cp. L.
17N1	D. O. Lane.....	Up	268	Dg	11	26-60				do.....	1.8	8-11-49	O	3/4	D	
17Q1	Paul and Marion Bellows.....	8	210	Dr	300	6	300	190	170	Sand, fine.....	174	May 1963	T	10	D, irr	Pumped 4 hrs at 63 gpm, 141-ft dd.
18E1	O. J. Shibley.....	8	136	Dg	40					Gravel, cemented, (Gravel, coarse.....	33.8	9-9-49	J	3/4	D	
19E1	Town of Ridge- field.....	8	40	Dg	36	120	34	8	27	Gravel, coarse.....	22		T	20	P8	Pumped 4 hrs at 260 gpm, 11-ft dd. Water temp 81°. Cp.
19E2	do.....	8	36	Dg	36	120	36	14		Gravel.....			O	46	P8	Pumped 12 hrs at 260 gpm, 6-ft dd. Pumped 160 gpm, 16-ft dd. L.
19E3	do.....	8	36	Dr	66	10	66	60	6	do.....	38	May 1966			P8	Cp. Pumped 30 gpm, 6 ft dd. L.
19K1	O. Benedict.....	8	66	Dr	117	6				do.....	62		J	3/4	D	Cp.
19H1	A. F. Frewing.....	8	210	Dr	160	6	160	146	8	Gravel and sand.....	171	September 1966			D	Pumped 30 gpm, 6 ft dd. L.
20O1	Pearl Talbot.....	Up	260	Dr	343	6	343	310	28	Sand.....	229		T		irr	Pumped 60 gpm, 28-ft dd. L.
20E1	E. H. Northrup.....	Up	220	Dg	32	48				do.....	21		C	3/4	D	Cp.
20F1	G. Hiramlett.....	Up	218	Dg	9	36				Gravel.....	8.9	8-11-49	O	3/4	D	
20O1	John Ryf.....	Up	260	Dr	227	6	227			Gravel, cemented, do.....			P	1 1/2	D	Pumped 10 gpm. L.
21A1	A. Kapus.....	Up	272	Dr	196	6				Sand.....	189		P	1	D	
21E1	F. Forsberg.....	Up	268	Dr	119	6				Gravel.....	110		P	1	D	
21J1	C. Greeley.....	Up	283	Dr	210	6				Sand.....	180		P	2	D, 8	
21L1	H. Lohli.....	Up	265	Dr	202	6				Gravel.....	174		P	1	D	Cp.

22A1	Jules Kornheart.....	Up	280	Dr	601	8	601						T	8	D, 8	
22H1	F. Schwelzer.....	Up	200	Dr	671	4				Sand.....	260		T	6	D, 8	Used for dairy. Cp.
22H1	J. Olarum.....	Up	280	Dg	18	48				do.....	14		C	3/4	D	
22N1	D. Hollowell.....	Up	270	Dr	186	6		100		Gravel.....	168					Cemented gravel from 85 to 168 ft. Pumped 1 hr at 30 gpm, 12-ft dd. Boiler test, 4-ft dd. L.
22N2	J. Timma.....	Up	276	Dr	174	6	174	169	8	Sand and gravel.....	166					Pumped 100 gpm, 16-ft dd. L.
23A1	William McKee.....	Up	300	Dr	310	6	310	312	11	Sand, coarse.....	278		T	6	irr	

# SWEET, EDWARDS & ASSOCIATES, INC.

## WELL DATA

No. 6

Project Pacific Wood

Owner (b) (6) State No. 41E-17 dsh  
 Address \_\_\_\_\_ Other No. \_\_\_\_\_  
 Tenant same  
 Address same  
 Type of Well: Hydrograph ☐ Key ☐ Index ☐ Semiannual ☐ Quality ☒  
 Location: County Clark Basin Lewis No. \_\_\_\_\_  
 U.S.G.S. Quad. Hydgetfield Quad. No. \_\_\_\_\_  
NE  $\frac{1}{4}$  SE  $\frac{1}{4}$  Section 47, Twp. 4N, Rge. 1E Will. Meridian  
 Description \_\_\_\_\_

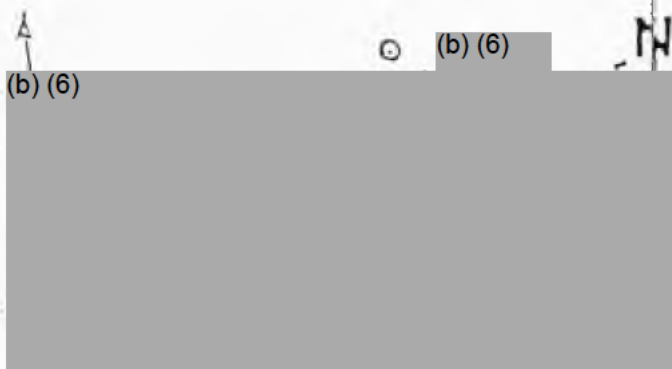
Reference Point description Top of casing

which is 1 ft. <sup>above</sup> land surface. Ground Elevation 130 ft A.S.L.  
 Reference Point Elev. \_\_\_\_\_ ft. Determined from \_\_\_\_\_  
 Well: Use domestic Condition good Depth \_\_\_\_\_ ft.  
 Casing, size \_\_\_\_\_ In., perforations \_\_\_\_\_

Measurements By: DWR ☐ USGS ☐ USBR ☐ County ☐ Irr. Dist. ☐ Water Dist. ☐ Cons. Dist. ☐ Other ☒  
 Chief Aquifer: Name SEE LOG Depth to Top Aq. \_\_\_\_\_ Depth to Bot. Aq. \_\_\_\_\_  
 Type of Material \_\_\_\_\_ Perm. Rating \_\_\_\_\_ Thickness \_\_\_\_\_  
 Gravel Packed? Yes ☐ No ☐ Depth to Top Gr. \_\_\_\_\_ Depth to Bot. Gr. \_\_\_\_\_  
 Supp. Aquifer \_\_\_\_\_ Depth to Top Aq. \_\_\_\_\_ Depth to Bot. Aq. \_\_\_\_\_  
 Driller \_\_\_\_\_  
 Date drilled \_\_\_\_\_ Log, filed \_\_\_\_\_ open (1) \_\_\_\_\_ confidential (2) \_\_\_\_\_  
 Equipment: Pump, type submersible make \_\_\_\_\_  
 Serial No. \_\_\_\_\_ Size of discharge pipe \_\_\_\_\_ In.  
 Power, Kind: \_\_\_\_\_ Make \_\_\_\_\_  
 H. P. \_\_\_\_\_ Motor Serial No. \_\_\_\_\_  
 Elec. Meter No. \_\_\_\_\_ Transformer No. \_\_\_\_\_  
 Yield \_\_\_\_\_ G.P.M. Pumping level \_\_\_\_\_ ft.

Water Analysis: Min. (1) \_\_\_\_\_ San. (2) \_\_\_\_\_ H.M. (3) \_\_\_\_\_  
 Water Levels available: Yes (1) \_\_\_\_\_ No \_\_\_\_\_  
 Period of Record: Begin \_\_\_\_\_ End \_\_\_\_\_  
 Collecting Agency: \_\_\_\_\_  
 Prod. Rec. (1) \_\_\_\_\_ Pump Test (2) \_\_\_\_\_ Yield (3) \_\_\_\_\_

SKETCH



REMARKS

Well set in concrete ring w/  
 SD. got for sampling inside.  
(b) (6)

Recorded by: UES

Original and First Copy with  
State of Ecology  
Copy - Owner's Copy  
Copy - Driller's Copy

# WATER WELL REPORT

STATE OF WASHINGTON

Application No. \_\_\_\_\_

Permit No. \_\_\_\_\_

(b) (6)

Well Address Approx. (b) (6)

Richland

OWNER: Name \_\_\_\_\_

LOCATION OF WELL: County Clark

NE 1/4 - 16W 1/2 SE 1/4 Sec 17 T 4 N. R 1 E W.M.

and distance from section or subdivision corner \_\_\_\_\_

PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐  
Irrigation ☐ Test Well ☐ Other ☐

TYPE OF WORK: Owner's number of well (if more than one) \_\_\_\_\_  
New well ☒ Method: Dug ☐ Bored ☐  
Deepened ☐ Cable ☐ Driven ☐  
Reconditioned ☐ Rotary ☒ Jetted ☐

DIMENSIONS: Diameter of well 6 inches.  
Drilled 180 ft. Depth of completed well 179 ft.

## INSTRUCTION DETAILS:

Casing installed: 6" Diam. from 0 ft. to 123 1/2 ft.  
Threaded ☐ 5/8" Diam. from 171 ft. to 174 ft.  
Welded ☒ \_\_\_\_\_" Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Perforations: Yes ☐ No ☒  
Type of perforator used \_\_\_\_\_  
SIZE of perforations \_\_\_\_\_ in. by \_\_\_\_\_ in.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

SCREENS: Yes ☒ No ☐  
Manufacturer's Name Johnson  
Type Stainless Steel Model No \_\_\_\_\_  
Diam. 6 Slot size 1/8 from 174 ft. to 179 ft.  
Diam. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: \_\_\_\_\_  
Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.  
Material used in seal Ben-Yonite  
Did any strata contain unusable water? Yes ☐ No ☒  
Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
Method of sealing strata off \_\_\_\_\_

PUMP: Manufacturer's Name \_\_\_\_\_  
Type: \_\_\_\_\_ HP \_\_\_\_\_

WATER LEVELS: Land-surface elevation \_\_\_\_\_ ft.  
level 156 ft. below top of well Date 7/23/82  
Artisan pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_  
Artesian water is controlled by \_\_\_\_\_ (Cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level  
Is a pump test made? Yes ☐ No ☒ If yes, by whom? \_\_\_\_\_  
gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Every data (time taken as zero when pump turned off) (water level ensured from well top to water level)			
Time	Water Level	Time	Water Level

Date of test \_\_\_\_\_  
Pump test 11 gal./min. with 4 ft. drawdown after 1 hrs.  
Pump flow \_\_\_\_\_ g.p.m. Date \_\_\_\_\_  
Temperature of water \_\_\_\_\_ Was a chemical analysis made? Yes ☒ No ☐  
(in 5 ppm)

## (10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
<u>Topsoil</u>	<u>0</u>	<u>1</u>
<u>Gravel &amp; cobbles with brown clay</u>	<u>1</u>	<u>15</u>
<u>Gravel, partially cemented</u>	<u>15</u>	<u>77</u>
<u>Clay, tan</u>	<u>77</u>	<u>108</u>
<u>Sand, brown, cemented</u>	<u>108</u>	<u>112</u>
<u>Sand, tan</u>	<u>112</u>	<u>126</u>
<u>Sand, brown</u>	<u>126</u>	<u>140</u>
<u>Sand, brown, coarse with gravel, brown &amp; black cemented</u>	<u>140</u>	<u>156</u>
<u>Sand, brown</u>	<u>156</u>	<u>173</u>
<u>Sand, brown, coarse water bearing</u>	<u>173</u>	<u>180</u>

RECEIVED

AUG 9 1982

DEPARTMENT OF ECOLOGY  
SOUTHWEST REGIONAL OFFICE

Work started 7/22 1982 Completed 7/23 1982

## WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME RITOLA WELL DRILLING  
14214 N.E. 202ND AVE. - Ph. 892-4754 (Type or print)  
Address Brush Prairie, Wash. 98506  
[Signed] David Ritola (Well Driller)  
License No. 423 Date 7/23 1982

# SWEET, EDWARDS & ASSOCIATES, INC.

## WELL DATA

No. 1

Project Pacific Wood

Owner (b) (6) State No. 4N/1E-1T dba  
 Address Ridgefield, WA Other No. \_\_\_\_\_  
 Tenant same  
 Address \_\_\_\_\_

Type of Well: Hydrograph ☐ Key ☐ Index ☒ Semiannual ☐ Quality ☒  
 Location: County Clark Basin \_\_\_\_\_ No. \_\_\_\_\_  
 U.S.G.S. Quad. Ridgefield Quad. No. \_\_\_\_\_  
NW  $\frac{1}{4}$  SE  $\frac{1}{4}$  Section 17, Twp. 4N, Rps. 1E Will. Meridian

Description No log on file - recollected depth @ 274 or 294 ft.

Reference Point description \_\_\_\_\_

which is 1 ft. above land surface. Ground Elevation 190 ft  
 Reference Point Elev. \_\_\_\_\_ ft. Determined from Quadr  
 Well: Use domestic Condition (noticed iron precip.) Depth \_\_\_\_\_ ft.  
 Casing, size 6 in., perforations \_\_\_\_\_

Measurements By: DWR ☐ USGS ☐ USBR ☐ County ☐ Irr. Dist. ☐ Water Dist. ☐ Cons. Dist. ☐ Other ☐

Chief Aquifer: Name \_\_\_\_\_ Depth to Top Aq. \_\_\_\_\_ Depth to Bot. Aq. \_\_\_\_\_

Type of Material \_\_\_\_\_ Perm. Rating \_\_\_\_\_ Thickness \_\_\_\_\_

Gravel Packed? Yes ☐ No ☐ Depth to Top Gr. \_\_\_\_\_ Depth to Bot. Gr. \_\_\_\_\_

Supp. Aquifer \_\_\_\_\_ Depth to Top Aq. \_\_\_\_\_ Depth to Bot. Aq. \_\_\_\_\_

Driller \_\_\_\_\_

Date drilled \_\_\_\_\_ Log, filed \_\_\_\_\_ open (1) \_\_\_\_\_ confidential (2) \_\_\_\_\_

Equipment: Pump, type submersible make \_\_\_\_\_

Serial No. \_\_\_\_\_ Size of discharge pipe \_\_\_\_\_ in.

Power, Kind \_\_\_\_\_ Make \_\_\_\_\_

H. P. \_\_\_\_\_ Motor Serial No. \_\_\_\_\_

Elec. Meter No. \_\_\_\_\_ Transformer No. \_\_\_\_\_

Yield \_\_\_\_\_ G.P.M. Pumping level \_\_\_\_\_ ft.

Water Analysts: Min. (1) \_\_\_\_\_ San. (2) \_\_\_\_\_ H.M. (3) \_\_\_\_\_

Water Levels available: Yes (1) \_\_\_\_\_ No \_\_\_\_\_

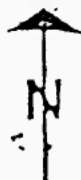
Period of Record: Begin \_\_\_\_\_ End \_\_\_\_\_

Collecting Agency: \_\_\_\_\_

Prod. Rec. (1) \_\_\_\_\_ Pump Test (2) \_\_\_\_\_ Yield (3) \_\_\_\_\_

SKETCH

(b) (6)



REMARKS

sample from spigot &  
house - north side

Well located (b) (6)  
in concrete ring

Recorded by: \_\_\_\_\_  
 Date: \_\_\_\_\_

# SWEET, EDWARDS & ASSOCIATES, INC.

## WELL DATA

No. 8

Project Pacific Wood

Owner: (b) (6)  
 Address: Ridgefield  
 State No. 44/1E - 17 acc  
 Other No. \_\_\_\_\_

Address: \_\_\_\_\_  
 Type of Well: Hydrograph ☒ Key ☐ Index ☐ Semiannual ☐ Quality ☐  
 Location: County \_\_\_\_\_ Basin \_\_\_\_\_ No. \_\_\_\_\_

U.S.G.S. Quad. \_\_\_\_\_  
SW  $\frac{1}{4}$  NE  $\frac{1}{4}$  Section 17, Twp. 1N, Rge. 4E Will. Meridian

Description: McGhee reported 206 ft. deep well to gravel and sand from 56-13  
and well @ 210 ft

Reference Point description: \_\_\_\_\_

Which is 1 ft. above below land surface. Ground Elevation 215 ft.

Reference Point Elev. \_\_\_\_\_ ft. Determined from \_\_\_\_\_

Well Use domestic & farm Condition good Depth \_\_\_\_\_ ft.

Casing, size 6 in., perforations \_\_\_\_\_

Measurements By: DWR ☐ USGS ☐ USBR ☐ County ☐ Irr. Dist. ☐ Water Dist. ☐ Cons. Dist. ☐ Other ☒

Chief Aquifer: Name Troutdale Depth to Top Aq. \_\_\_\_\_ Depth to Bot. Aq. \_\_\_\_\_

Type of Material sand & gravel Perm. Rating \_\_\_\_\_ Thickness \_\_\_\_\_

Gravel Packed? Yes ☐ No ☐ Depth to Top Gr. 56 Depth to Bot. Gr. \_\_\_\_\_

Upper Aquifer \_\_\_\_\_ Depth to Top Aq. \_\_\_\_\_ Depth to Bot. Aq. \_\_\_\_\_

Driller McGhee, Kelso, WA

Date drilled \_\_\_\_\_ Log, filed Can't find. open (1) \_\_\_\_\_ confidential (2) \_\_\_\_\_

Equipment: Pump, type submersible make \_\_\_\_\_

Serial No. \_\_\_\_\_ Size of discharge pipe \_\_\_\_\_ in.

Power, Kind: \_\_\_\_\_ Make \_\_\_\_\_

4. P. \_\_\_\_\_ Motor Serial No. \_\_\_\_\_

Elec. Meter No. \_\_\_\_\_ Transformer No. \_\_\_\_\_

Yield \_\_\_\_\_ G.P.M. Pumping level \_\_\_\_\_ ft.

Water Analysis: Min. (1) \_\_\_\_\_ Son. (2) \_\_\_\_\_ H.M. (3) \_\_\_\_\_

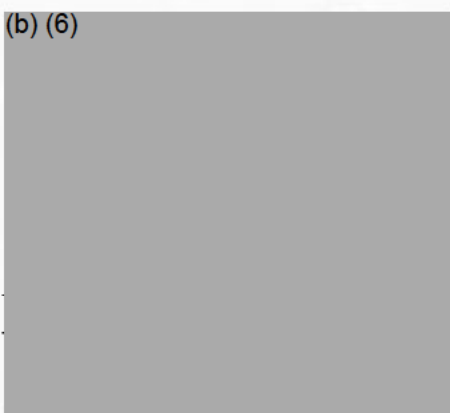
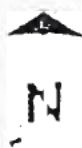
Water Levels available: Yes (1) 210 ft. No \_\_\_\_\_

Period of Record: Begin \_\_\_\_\_ End \_\_\_\_\_

Collecting Agency: \_\_\_\_\_

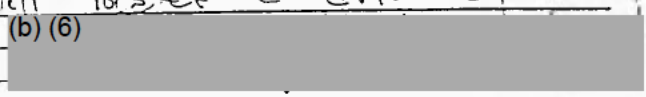
Prod. Rec. (1) \_\_\_\_\_ Pump Test (2) \_\_\_\_\_ Yield (3) \_\_\_\_\_

SKETCH

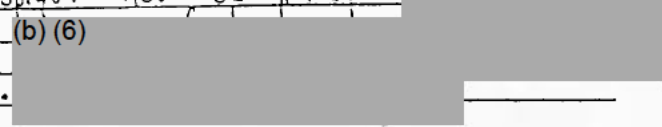


REMARKS

Well located @ driveway



Sp. got for sampling



Recorded by: HKS  
 Date: 6/1/83

SWEET, EDWARDS & ASSOCIATES, INC.  
WELL DATA

Project Pacific Wood

State No. 4/IE-17 d'bb  
Other No. \_\_\_\_\_

(b) (6)

Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_  
Zip \_\_\_\_\_

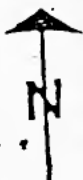
County Clark Hydrograph ☐ Key ☐ Index ☐ Semiannual ☐ Quality ☒  
Basin Lewis Quad. No. \_\_\_\_\_  
U.S.G.S. Quad. Ricefield Will. Meridian \_\_\_\_\_  
NW 1/4 SE 1/4 Section \_\_\_\_\_, Twp. 4N, Rgn. 1E  
Description \_\_\_\_\_

Reference Point description \_\_\_\_\_

which is NA ft. above land surface. Ground Elevation 240 ft. msl ft.  
Reference Point Elev. \_\_\_\_\_ ft. Determined from \_\_\_\_\_ Depth \_\_\_\_\_ ft.  
Well Use \_\_\_\_\_ Condition \_\_\_\_\_  
Casing, size \_\_\_\_\_ in.; perforations \_\_\_\_\_

Measurements By: DWR ☐ USGS ☐ USBR ☐ County ☐ Irr. Dist. ☐ Water Dist. ☐ Cons. Dist. ☐ Other ☐  
Name of Aquifer: \_\_\_\_\_ Depth to Top Aq. \_\_\_\_\_ Depth to Bot. Aq. \_\_\_\_\_  
Type of Material \_\_\_\_\_ Perm. Rating \_\_\_\_\_ Thickness \_\_\_\_\_  
Gravel Packed? Yes ☐ No ☐ Depth to Top Gr. \_\_\_\_\_ Depth to Bot. Gr. \_\_\_\_\_  
App. Aquifer \_\_\_\_\_ Depth to Top Aq. \_\_\_\_\_ Depth to Bot. Aq. \_\_\_\_\_  
Driller LOG NOT AVAILABLE open (1) \_\_\_\_\_ confidential (2) \_\_\_\_\_  
Date drilled \_\_\_\_\_ Log, filed \_\_\_\_\_  
Equipment: Pump, type \_\_\_\_\_ make \_\_\_\_\_  
Serial No. \_\_\_\_\_ Size of discharge pipe \_\_\_\_\_ in.  
Power, Kind \_\_\_\_\_ Make \_\_\_\_\_  
H. P. \_\_\_\_\_ Motor Serial No. \_\_\_\_\_  
Elec. Meter No. \_\_\_\_\_ Transformer No. \_\_\_\_\_  
Yield \_\_\_\_\_ G.P.M. Pumping level \_\_\_\_\_ ft.  
Water Analysts: Min. (1) \_\_\_\_\_ San. (2) \_\_\_\_\_ H.M. (3) \_\_\_\_\_  
Water Levels available: Yes (1) \_\_\_\_\_ No \_\_\_\_\_  
Period of Record: Begin \_\_\_\_\_ End \_\_\_\_\_  
Collecting Agency: \_\_\_\_\_  
Prod. Rec. (1) \_\_\_\_\_ Pump Test (2) \_\_\_\_\_ Yield (3) \_\_\_\_\_

SKETCH



REMARKS

(b) (6)

Recorded by: \_\_\_\_\_

SWEET, EDWARDS & ASSOCIATES, INC.  
WELL DATA

No. \_\_\_\_\_

Project Pacific Wood

Owner (b) (6) State No. AN/IE - 17 CC 2  
Address Kidderfield Other No. \_\_\_\_\_  
Name same

Type of Well: Hydrograph ☒ Key ☐ Index ☐ Semiannual ☐ Quality ☐  
Location: County Clark Basin \_\_\_\_\_ No. \_\_\_\_\_  
S.G.S. Quad. Kidderfield Quad. No. \_\_\_\_\_  
SW  $\frac{1}{4}$  NE  $\frac{1}{4}$  Section 17, Twp. 4N, Rge. 1E Will. Meridian

Description \_\_\_\_\_  
\_\_\_\_\_

Reference Point description \_\_\_\_\_

which is 1 ft. <sup>above</sup> land surface. Ground Elevation 255 ft.

Reference Point Elev. \_\_\_\_\_ ft. Determined from \_\_\_\_\_

Well: Use domestic Condition \_\_\_\_\_ Depth \_\_\_\_\_

Casing size 6 in. In., perforations \_\_\_\_\_

Measurements By: DWR ☐ USGS ☐ USBR ☐ County ☐ Irr. Dist. ☐ Water Dist. ☐ Cons. Dist. ☐ Other ☒

Chief Aquifer: Name \_\_\_\_\_ Depth to Top Aq. \_\_\_\_\_ Depth to Bot. Aq. \_\_\_\_\_

Type of Material \_\_\_\_\_ Perm. Rating \_\_\_\_\_ Thickness \_\_\_\_\_

Gravel Packed? Yes ☐ No ☐ Depth to Top Gr. \_\_\_\_\_ Depth to Bot. Gr. \_\_\_\_\_

Supp. Aquifer \_\_\_\_\_ Depth to Top Aq. \_\_\_\_\_ Depth to Bot. Aq. \_\_\_\_\_

Driller SEE LOG

Date drilled \_\_\_\_\_ Log, filed \_\_\_\_\_ open (1) \_\_\_\_\_ confidential (2) \_\_\_\_\_

Equipment: Pump, type \_\_\_\_\_ make \_\_\_\_\_

Serial No. \_\_\_\_\_ Size of discharge pipe \_\_\_\_\_ in.

Power, Kind \_\_\_\_\_ Make \_\_\_\_\_

H. P. \_\_\_\_\_ Motor Serial No. \_\_\_\_\_

Elec. Meter No. \_\_\_\_\_ Transformer No. \_\_\_\_\_

Yield \_\_\_\_\_ G.P.M. Pumping level \_\_\_\_\_ ft.

Water Analysis: Min. (1) \_\_\_\_\_ San. (2) \_\_\_\_\_ H.M. (3) \_\_\_\_\_

Water Levels available: Yes (1) \_\_\_\_\_ No \_\_\_\_\_

Period of Record: Begin \_\_\_\_\_ End \_\_\_\_\_

Collecting Agency: \_\_\_\_\_

Prod. Rec. (1) \_\_\_\_\_ Pump Test (2) \_\_\_\_\_ Yield (3) \_\_\_\_\_

SKETCH

(b) (6)



REMARKS

(b) (6)

Recorded by: HRS  
Date: 6/1/87

(b) (6)

OWNER: Name

Ridgfield, WA

LOCATION OF WELL: County Clark - S.W. 1/4 NE 1/4 Sec. 17 T. 4 N. R. 1 W.M.

and distance from section or subdivision corner

PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐  
Irrigation ☐ Test Well ☐ Other ☐

TYPE OF WORK: Owner's number of well (if more than one) .....  
New well ☒ Method: Dug ☐ Bored ☐  
Deepened ☐ Cable ☒ Driven ☐  
Reconditioned ☐ Rotary ☐ Jetted ☐

DIMENSIONS: Diameter of well 6 inches.  
Holed 290 ft. Depth of completed well 290 ft.

#### CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to 278 ft.  
Threaded ☐ 5 " Diam. from 277 ft. to 279 ft.  
Welded ☒ 5 " Diam. from 284 ft. to 290 ft.

Perforations: Yes ☐ No ☒

Type of perforator used .....  
SIZE of perforations ..... in. by ..... in.  
..... perforations from ..... ft. to ..... ft.  
..... perforations from ..... ft. to ..... ft.  
..... perforations from ..... ft. to ..... ft.

Screens: Yes ☒ No ☐

Manufacturer's Name Johnson  
Type Stainless Steel Model No. ....  
Diam. 6 Slot size 15 from 279 ft. to 284 ft.  
Diam. .... Slot size .... from .... ft. to .... ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: .....  
Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☒ No ☐ To what depth? 25 ft.  
Material used in seal Bentonite & drill cuttings  
Did any strata contain unusable water? Yes ☐ No ☒  
Type of water? ..... Depth of strata .....  
Method of sealing strata off .....

PUMP: Manufacturer's Name .....  
Type: HP

WATER LEVELS: Land-surface elevation ..... ft.  
Static level 238 ft. below top of well Date 7-21-75  
Artesian pressure ..... lbs. per square inch Date .....  
Artesian water is controlled by ..... (Cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level  
pump test made? Yes ☐ No ☒ If yes, by whom? .....  
gal./min. with ..... ft. drawdown after ..... hrs.

every data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....

Date of test 7-22  
test 12 gal./min. with 279 ft. drawdown after 1 hrs.  
an flow ..... g.p.m. Date .....

temperature of water ..... Was a chemical analysis made? Yes ☐ No ☒

#### (10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Brown clay soil	0	2
Light brown clay	2	25
Light brown silty clay	25	35
Brown silty sand	35	51
Fine brown sand & occasional		
al gravel	51	57
Fine brown sand	57	76
Cemented gravel	76	95
Loose gravel	95	130
Dry brown sand	130	191
Brown silty clay	191	196
Dry gray-brown sand	196	245
Red-brown sandy clay & fine		
gravel	245	251
Dark brown partially cement-		
ed sand, gravel & water	251	256
Light brown sand & water	256	285
Brown sandy clay	285	290

Work started 7-9, 19 75 Completed 7-21, 19 75

#### WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Hansen Drilling Co., Inc.  
(Person, firm, or corporation) (Type or print)

Address 6711 NE 58th Ave., Vancouver, WA.  
0546 Carl Zent

(Signed) Carl Zent  
(Well Driller) Hansen

C51  
License No. 223.02.1155 Date July 22, 19 75

APPENDIX B  
LYSIMETER LOCATIONS AND LOGS

N.W. 289th Street

PROPERTY LINE

DITCH

DITCH

LS-3

WAREHOUSE

DITCH

STEEL PIPE

SURFACE DRAIN AND  
UNDERDRAIN SUMP \*

TOE DRAIN SUMP \*\*

STAND  
PIPE

TOE DRAIN

REFUSE AREA

STAND PIPE

PROPERTY LINE

FENCE

PROPERTY LINE

NOTE:

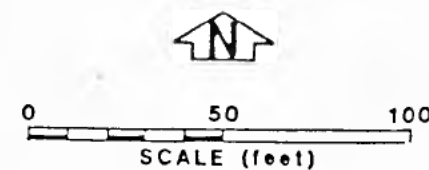
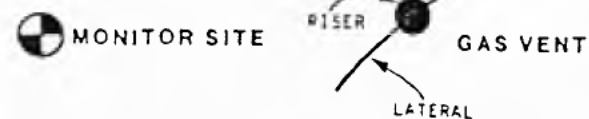
This drawing is based on surveys  
prepared by:  
1) Clark County,  
2) Niedermeyer-Martin Co.,  
3) Lawson Land Surveying and,  
4) onsite measurements by  
Sweet-Edwards.  
For detail of property boundaries  
and location of refuse area, see  
surveyors plat (in back pocket).

LS-2

PROPERTY LINE

LS-1

# EXPLANATION



## NOTES:

- \* PIPE AND SUMP EXISTED PRIOR TO CLOSURE.
- \*\* INSTALLED 11/30 83 (POST-CLOSURE MAINTENANCE).



Sweet, Edwards & Associates, Inc.  
P.O. Box 328 • Kenosha, WI 53140 • 262-423-3580

IN ASSOCIATION WITH:  
PATRICK H. WICKS, P.E.  
CONSULTANT IN HAZARDOUS WASTE MANAGEMENT

\* FINAL CLOSURE LAYOUT

RBT SITE  
OPTION III

\* Final Topography



PROJECT Pacific Wood Treating / RBT Site

Page 1 of 1

Location Ridgefield Brick &amp; Tile

Boring No. LS-1

Surface Elevation

Drilling Method Auger

Total Depth 54.5 ft.

Drilled By Sweet, Edwards &amp; Assoc.

Date Completed 9/12/83

Logged By J. Maul

WELL DETAILS	PENE- TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE		PERME- ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
			NO.	TYPE				
Bentonite Pellets		10						
Native Soil Backfill		20						
1.5 in. PVC riser		30						
Bentonite Pellets		40						
Suction Lines		43.5	4-1A				43.5'-45.25' SILTY SAND- Tanish orange, lenses of feldspathic mica sand, medium fine, unsaturated.	
		45.25	4-1B					
		50	4-2A				52.0'-54.25' SAND- Orange and tan streaks, heavily oxidized, trace silt.	
			4-2B					
Suction Lysimeter		54.5					Gravels at 54.5'. Auger refusal.	
Native Soil Slurry		60					Suction lysimeter installed at 52.0'.	
		70						



PROJECT Pacific Wood Treating / RBT Site

Page 1 of 1

Location Ridgefield Brick and Tile

Boring No. LS-2

Surface Elevation

Drilling Method Auger

Total Depth 15.0 ft.

Drilled By Sweet, Edwards &amp; Assoc.

Date Completed 9/28/83

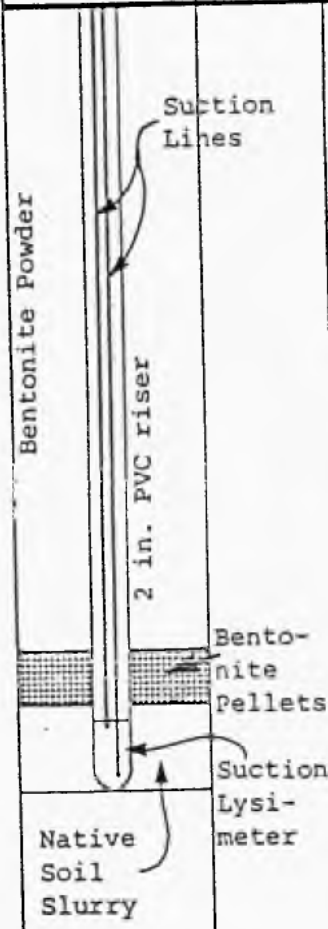
Logged By J. Maul

WELL DETAILS	PENE- TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE		PERME- ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
			NO.	TYPE				
		5	1	SP		CL	2.5'-4.0' SILT CLAY- Grey to tan, slight mottling, hard, dry, black nodules.	
		10	2	"		CL	7.5'-9.0' SILTY CLAY- Grey to tan, increased mottling, larger more abundant nodules, moist.	
		15	3	SP		ML	12.5'-14.0' SILT- Tan with some orange streaking, trace fine sand.	
		20					Gravels at 15.0 ft. Auger refusal. Suction lysimeter installed at 15.0 ft.	
		25						
		30						

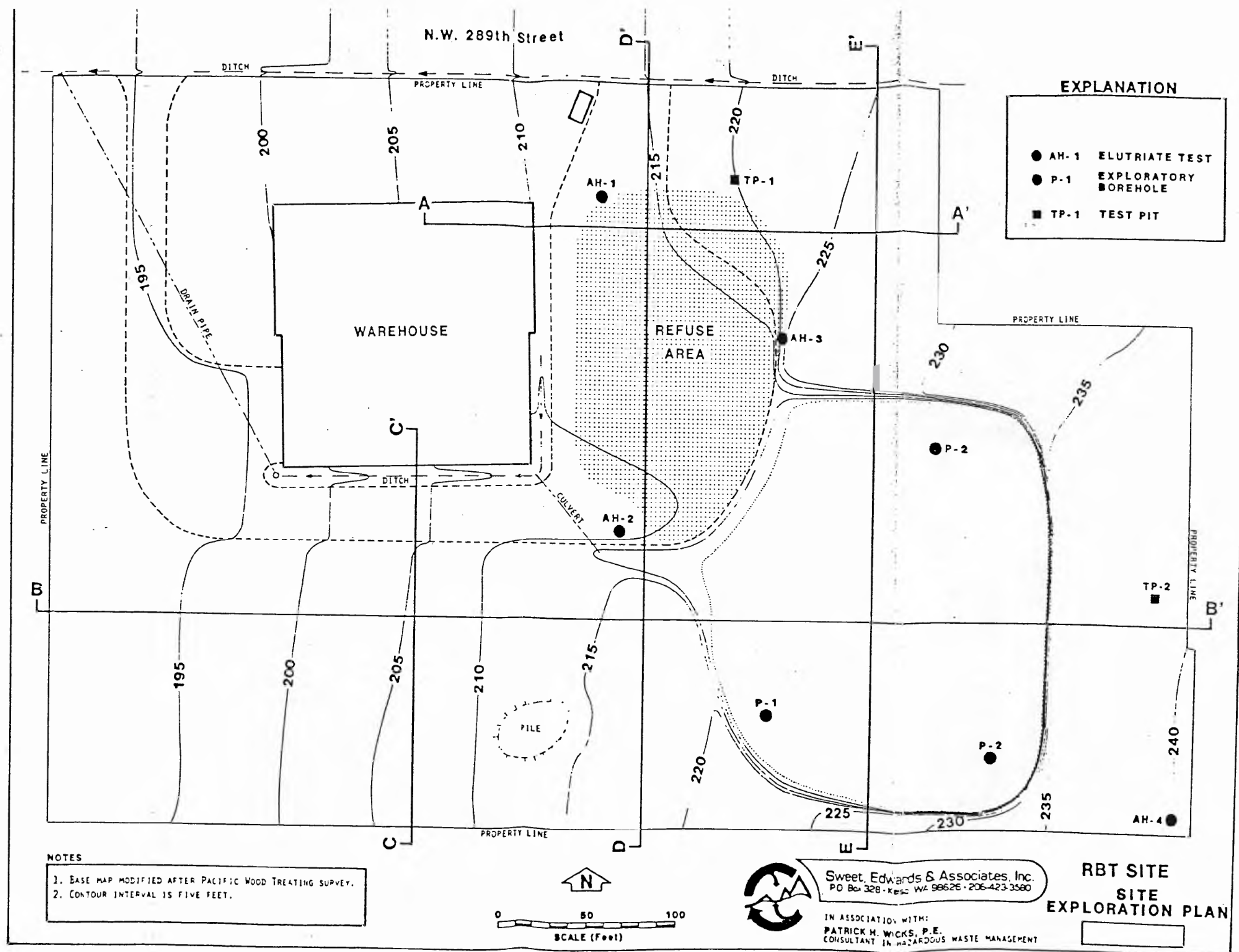
PROJECT Pacific Wood Treating / RBT SitePage 1 of 1Location Ridgefield Brick and TileBoring No. LS-3

Surface Elevation \_\_\_\_\_

Drilling Method AugerTotal Depth 23.5 ft.Drilled By Sweet, Edwards & Assoc.Date Completed 9/28/83Logged By J. Maul

WELL DETAILS	PENE- TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE		PERME- ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
			NO.	TYPE				
		5	1	SP		ML	3.5'-5.0' <u>CLAYEY SILT</u> - Brown to greyish tan, hard.	
		10	2	"		ML	8.5'-10.0' <u>CLAYEY SILT</u> - Heavy mineral staining (black), slightly oxidized.	
		15	3	"		ML	13.5'-15.0' <u>CLAYEY SILT</u> - Increased oxidation, slightly mottled.	
		20	4	"		ML	18.5'-20.0' <u>CLAYEY SILT</u> - Brownish orange, some grey, black mineral precipitation.	
		25					Gravels at 23.5'. Auger refusal.  Suction lysimeter installed at 23.5'.	
		30						

APPENDIX C  
TEST PIT AND BOREHOLE LOGS





PROJECT NAME Pacific Wood Treating / RBT  
PROJECT NUMBER \_\_\_\_\_ BORING NUMBER AH-1  
DATE OF BORING 9/8/83  
GROUND ELEVATION AT BORING WHEN DRILLED 225 ft. msl (USGS quad.)

SAMPLE DATA				STANDARD PENETRATION RESISTANCE, N. BLOWS/FOOT	WATER TABLE	SYMBOL	SOIL AND ROCK DESCRIPTION AND COMMENTS
DEPTH, FEET	NUMBER	LOCATION	CLASS SYMBOL				
				0	50	100	
	1a 1b		CL				3.3'-5.0' <u>Silty Clay</u> - mottled, tan-brown, hard, stiff.
5							5.0'-6.0' As above.
	1-2a 1-2b		CL				8.3'-10.0' As above.
10							
	1-3a 1-3b		ML				13.3'-15.0' <u>Clayey Silt</u> - mottled grey-reddish brown, stiff, crumbly.
15							
	1-4a 1-4b		ML				20.9'-22.4' <u>Clayey Silt</u> - orange/ brown, slightly mottled, angular fracture.
20							Gravels at 23 ft.
25							
30							

PROJECT NAME Pacific Wood Treating / RBTPROJECT NUMBER \_\_\_\_\_ BORING NUMBER AH-2DATE OF BORING 9/8/83 and 9/9/83GROUND ELEVATION AT BORING WHEN DRILLED 210 ft. msl (USGS quad.)

SAMPLE DATA				STANDARD PENETRATION RESISTANCE, N. BLOWS/FOOT	WATER TABLE	SYMBOL	SOIL AND ROCK DESCRIPTION AND COMMENTS
DEPTH, FEET	NUMBER	LOCATION	CLASS SYMBOL				
				0	50	100	
	2-1a 2-1b		ML				3.3'-4.8' <u>Silty Clay</u> - Mottled, tan to brownish orange, stiff.
5							
	2-2a 2-2b		ML				8.5'-10.0' As above.
10							
	2-3a 2-3b		ML				13.5'-15.0' As above.
15							
	2-4a 2-4b		ML				18.5'-20.0' As above, earthy tan- brown.
20							
							Gravels at 20 ft.
25							
30							

PROJECT NAME Pacific Wood Treating / RBTPROJECT NUMBER \_\_\_\_\_ BORING NUMBER AH-3DATE OF BORING 9/9/83GROUND ELEVATION AT BORING WHEN DRILLED 220 ft. msl (USGS quad)

SAMPLE DATA				STANDARD PENETRATION RESISTANCE, N. BLOWS/FOOT	WATER TABLE	SYMBOL	SOIL AND ROCK DESCRIPTION AND COMMENTS
DEPTH, FEET	NUMBER	LOCATION	CLASS SYMBOL				
				0	50	100	
5							
10	3-1		CL	▲			11.0'-12.3' <u>Silty Clay</u> - tan to reddish brown, moist, pyrolusite nodules
15	3-2		CL	▲			17.5'-19.2' <u>Silty Clay</u> - orangish red, oxidized, some tan streaks, moist, sticky.
20	3-3a 3-3b		SM- ML				22.5'-24.2' <u>Gravelly Silty Sand, Sandy Silt</u> - tan to orangish brown, trace mica, weathered clasts.
25							Gravels at 24 ft.
30							Trace water in bottom of hole.

PROJECT NAME Pacific Wood Treating / RBTPROJECT NUMBER \_\_\_\_\_ BORING NUMBER AH-4DATE OF BORING 9/12/83GROUND ELEVATION AT BORING WHEN DRILLED 235 ft. (USGS quad)

SAMPLE DATA				STANDARD PENETRATION RESISTANCE, N. BLOWS/FOOT  ● WATER CONTENT, %	WATER TABLE	SYMBOL	SOIL AND ROCK DESCRIPTION AND COMMENTS
DEPTH, FEET	NUMBER	LOCATION	CLASS SYMBOL				
				0	50	100	
10							
20							
30							
40	4-1a 4-1b		SM				43.5'-45.2' <u>Silty Sand</u> - tanish orange, streaks of orange mica, feldspathic, medium to fine sand unsaturated.
50	4-2a 4-2		SM				52.5'-54.2' <u>Sand</u> - orange to tan streaks, heavily oxidized, trace silt, no mica.
60							Sand at 41.5 ft.  Gravels at 54.5 ft.

AH-1 GRAVEL AT 23'

AH-2 GRAVEL AT 20'

AH-3 GRAVEL AT 25'

AH-4 GRAVEL AT 54.5'

MICA SAND AT 41.5' (BASED UPON DECREASED DRILLING RESISTANCE)

P-1 GRAVELS AT 12'

P-2 GRAVEL AT 13'

P-3 GRAVEL AT 15'

SOILS LOG

AH-1 3.3-5 SILTY CLAY, <sup>slightly</sup> mottled tan-brown, stiff

5.05-6.05 AS ABOVE

8.3-10. AS ABOVE

13.3-15 CLAYEY SILT, slightly mottled grey-reddish brown, crumbly

20.4-22.4 CLAYEY SILT, orangish brown, angular fracture

AH-2 3.3-4.8 SILTY CLAY - mottled tan-brown<sup>ish-orange</sup>, stiff

8.5-10 SAME

13.5-15 SAME - EVENLY TAN

18.5-20 SAME - orangish brown, oxidized, slightly more silt.

AH-3 WASTE TO 10.5' - reached water below waste interring hole

11-12.3 SILTY Clay, tan to reddish brown, moist.

17.5-19.25 AS ABOVE, ORANGISH RED, oxidized some tan streaks, moist, sticky.

22.5-24.25 GRAVELLY SILTY SAND BELOW 4" <sup>SILTY</sup> SAND, tan-orangeish brown, GRAVELS moderately weathered, slightly indurated, sand graded medium fine, trace mica. ~~fine~~

APPENDIX D  
ANALYTICAL REPORTS



DATA SUMMARY

ORIGINAL TO: LAB FILES

COPIES TO: Eric Egbers

SOURCE

Ridgefield Brick and Tile

DATE COLLECTED

1-10-84

COLLECTED BY

Jim Maul

Sample (Log) Number	14	0134	0135	0136						
Station:	Muffet	Joc.	Falls							
	Well	Drain	Well							
pH (units)	6.6	6.0	6.7							
Turbidity (NTU)										
Sp. Conductivity (umhos/cm)										
COD										
BOD (5 day)										
Fecal Coliform (Col./100 ml)										
NO3-N										
NO2-N										
NH3-N										
T.Kjeldahl-N										
O-P04-P										
Total Phos.-P										
Total Solids										
Total Non Vol. Solids										
Total Suspended Solids										
Total Non Vol. Sus. Solids										
Naphthylene, µg/L	<0.06	0.17	<0.06							
PCP, µg/L	<10	<10	<10							

NOTE: All results are in mg/L(ppm) unless otherwise specified. ND is "None Detected"

"<" is "Less Than" and ">" is "Greater Than"

SUMMARIZED BY

J. Freeman

DATE

3-7-84

REVIEWED BY

P. Crawford

DATE

3-7-84



ENVIRONMENTAL LABORATORY  
DATA SUMMARY  
METALS

PAGE 2 OF 2

ORIGINAL TO: LAB FILES

COPIES TO:

M. McCall  
E. Egbers

SOURCE RIDGEFIELD BRICK & TILE

PROGRAM NUMBER 285

DATE COLLECTED 1/10/84 RECEIVED 1/13/84

COLLECTED BY JIM MAUL

Sample (Log) Number	Units	Standard Deviation ± %	140	140-	140-		140-	140	140
Station:			134	135	136		134	135	136
Cu-TOTAL	mg/L	10	<0.02	<0.02	0.05				
						pH	6.6	6.0	6.7
Zn Ag-TOTAL	mg/L	10	<0.02	<0.02	<0.02				
Fe Ba-TOTAL	mg/L	10	0.08	0.15	0.08				
Ni									
Cr-TOTAL	mg/L	10	<0.02	<0.02	<0.02				
Cd-TOTAL	mg/L	10	<0.01	<0.01	<0.01				
Pb-TOTAL	mg/L	10	0.10	0.08	0.04				
Hg-TOTAL	μg/L	10	<0.2	<0.2	<0.2				
As-TOTAL	μg/L	-	2	<1	4				
Se-TOTAL	μg/L	-	<1	<1	2				

NOTE: Dissolved Metals: Those that will pass through a 0.45 μ membrane filter

Suspended Metals: Those retained by a 0.45 μ membrane filter

Total Metals: Those found in the unfiltered, rigorously acid digested sample

mg/L = ppm = μg/ml

μg/L = ppb = ng/ml

mg/kg = ppm = μg/gm

μg/kg = ppb = ng/gm

"<" is "less than" and ">" is "greater than"

83265  
COPY



PACIFIC WOOD TREATING  
CORPORATION

February 08, 1984

Mr. Eric Egbers  
Department of Ecology  
State of Washington  
7272 Cleanwater Lane, LULU  
Olympia, WA 98504

SUBJECT: Laboratory Results  
RBT Site  
DE83-284

Dear Mr. Egbers,

*20 Dec 83 - 1st Sample*  
*11 Jan 84 - 2nd Sample*

Pursuant to our phone conversation of last Friday, February 3, please find enclosed copies of Laucks Testing Laboratories test results No. 83121 and 83265. As discussed, we feel that, as a result of these test results, we should be allowed to continue discharging the intermittent small flow of the toe drain to the existing drainage ditch as outlined in our Closure Plan.

If you need additional information, please do not hesitate to contact me.

Sincerely,

*[Signature]*  
Vince McQuiggin  
Project Coordinator

Mark Moothart  
Pat Wicks  
Randy Sweet

VFM/srr  
Enclosure

# Laucks

## Testing Laboratories, Inc.

940 South Harney Street, Seattle, Washington 98108 (206) 767-5060

Chemistry, Microbiology and Technical Services

RECEIVED  
FEB 06 1984  
P W T.



Certificate

CLIENT Pacific Wood Treating  
111 W. Division St.  
Ridgefield, WA 98642  
ATTN: Vince McQuiggin

LABORATORY NO 83121

DATE Feb. 3, 1984

REPORT ON WATER

Submitted 12/20/83 and marked as shown below:

SAMPLE  
IDENTIFICATION

TESTS PERFORMED  
AND RESULTS

- 1) LS-1 Soil Lysimetre RBT 12/14 11:05 J. Maul
- 2) LS-3 Field Filtered RBT 12/14 11:05 JJM, WRS
- 3) Rutkowski pit well RBT 12/14 11:50 JJM
- 4) Ridgefield WA pit well RYF 12/14 10:05 J. Maul Filtered
- 5) T.D. Sump Field Filt. RBT 12/14 12:43 JJM

parts per billion (ug/L)

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Pentachlorophenol	0.10	0.53	L/0.01	L/0.01	0.56
Naphthalene	*	*	L/1.	L/1.	10.

parts per million (mg/L)

Chromium	0.006	0.006	L/0.01	L/0.01	L/0.01
Copper	0.005	L/0.005	0.013	L/0.005	L/0.005
Arsenic	L/0.005	L/0.005	L/0.005	L/0.005	0.009
Cadmium	L/0.002	L/0.002	L/0.002	L/0.002	L/0.002
Lead	*	*	L/0.010	L/0.010	L/0.010
Mercury	*	*	L/0.001	L/0.001	L/0.001
Barium	*	*	L/0.10	L/0.10	0.10
Selenium	*	*	L/0.005	L/0.005	L/0.005
Silver	*	*	L/0.01	L/0.01	L/0.01

Key

L/ indicates "less than"

\*Insufficient sample available to perform analysis.

Laucks Testing Laboratories, Inc.

*J.M. Owens*  
J. M. Owens



JMO:bg

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# Laucks

## Testing Laboratories, Inc.

940 South Harney Street, Seattle, Washington 98108 (206) 767-5060

Chemistry, Microbiology, and Technical Services

RECEIVED

JAN 26 1984

P. W. T.



### Certificate

CLIENT Pacific Wood Treating  
111 W. Division St.  
Ridgefield, WA 98642  
ATTN: Vince McQuiggin

LABORATORY NO 83265

DATE Jan. 24, 1984

PO# 43061

REPORT ON WATER

SAMPLE  
IDENTIFICATION

Submitted 1/11/84 and marked as shown below:

TESTS PERFORMED  
AND RESULTS

1) TD	Ridge	1/10	1120
2) Muffet	Ridgefield	1/10	1051
3) Falls	Ridgefield	1/10	1006

parts per billion (ug/L)

	<u>1</u>	<u>2</u>	<u>3</u>
Pentachlorophenol	1.27	L/0.01	L/0.01
Naphthalene	5.	L/1.	L/1.

parts per million (mg/L)

Chromium	L/0.01	L/0.01	L/0.01
Copper	L/0.005	L/0.005	0.050
Arsenic	L/0.005	L/0.005	L/0.005
Cadmium	L/0.002	L/0.002	L/0.002
Lead	L/0.010	L/0.010	L/0.010
Mercury	L/0.001	L/0.001	L/0.001
Barium	L/0.1	L/0.1	L/0.1
Selenium	L/0.005	L/0.005	L/0.005
Silver	L/0.01	L/0.01	L/0.01

Key

L/ indicates "less than"

Respectfully submitted,

Laucks Testing Laboratories, Inc.

*Mike Nelson*  
Mike Nelson

MN:bg



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PACIFIC WOOD TREATING  
CORPORATION

*CWB* TRANSMITTAL COPY

TO: DEPARTMENT OF ECOLOGY  
State of Washington  
7272 Cleanwater Lane, LU11  
Olympia, Washington 98504

DATE 4/24/84

ATTN: Mr. Eric B. Egbers  
Regional Inspector

*26 Mar. 84 3rd Sample*

RBT Site - 2nd  
Quarter Test Results

TRANSMITTED: ☐ Here-with ☒ Enclosed ☐ After Separation  
☒ By Mail ☐ By Messenger

THE FOLLOWING MATERIAL:

Laucks Laboratory Report of 4/20/84, No. 84095  
Laucks Memo-Letter of 4/20/84

REMARKS:

BY *Vince McQuigg*  
Vince McQuigg  
Projects Coordinator

**LAUCKS TESTING LABORATORIES, INC.**

940 South Harney • Seattle, Washington 98108 • (206) 767-5060

NOV 1 1984

TO Pacific Wood Treating  
111 W. Division St.  
Ridgefield, WA 98642  
ATTN: Vince McQuiggin

DATE 4/20/84  
SUBJECT Lab #84095  
Naphthalene analysis

Dear Vince:

In reviewing the enclosed report, you will note that the lower limit of detection (LLD) for naphthalene is 5. parts per billion, where the LLD in the last report was 1. ppb.

Although we strive to give you the best possible LLD for your purposes, and to be consistent from report to report, it is not always possible to achieve identical results between different samples. In this case, there were background interferences in the samples which made the 1 ppb LLD impossible. If you have further questions as you review this, please feel free to contact me and I can put you in touch with the analyst who would be able to offer you a fuller explanation.

Very truly yours,



Barbara Gleason  
Client Services

enc.

# Laucks

## Testing Laboratories, Inc.

940 South Harney Street, Seattle, Washington 98108 (206)767-5060

Chemistry, Microbiology and Technical Services



## Certificate

CLIENT Pacific Wood Treating  
111 W. Division St.  
Ridgefield, WA 98642  
ATTN: Vince McQuiggin

LABORATORY NO 84095

DATE April 20, 1984

REPORT ON WATER

### SAMPLE IDENTIFICATION

Submitted 3/26/84 and identified as shown below:

### TESTS PERFORMED AND RESULTS

1) RUT	PWT/RBT	3/23	JM	1350	
2) MUF	PWT/RBT	3/23	JM	1350	
3) RYF	PWT/RBT	3/23	JM	1425	
4) Falls	PWT/RBT	3/23	JM	1240	
5) TD	PWT/RBT	3/23	JM	1140	Toe Drain Sump
6) LS-1	PWT/RBT	3/23	JM	1110	
7) LS-2	PWT/RBT	3/23	JM	1030	
8) LS-3	PWT/RBT	3/23	JM	1050	

pH, glass electrode at 25°C  
Specific Conductance,  
micromhos/cm at 25°C

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
7.6	7.6	8.1	7.7
280.	250.	210.	210.

### parts per million (mg/L)

Chromium	L/0.005	L/0.005	L/0.005	L/0.005
Copper	L/0.005	L/0.005	L/0.005	0.022
Arsenic	L/0.005	L/0.005	L/0.005	0.014
Cadmium	L/0.002	L/0.002	L/0.002	L/0.002
Lead	L/0.005	L/0.005	L/0.005	L/0.005
Mercury	L/0.001	L/0.001	L/0.001	L/0.001
Barium	L/0.1	0.1	L/0.1	0.1
Selenium	L/0.005	L/0.005	L/0.005	L/0.005
Silver	L/0.01	L/0.01	L/0.01	L/0.01

### parts per billion (ug/L)

Naphthalene	L/5.	L/5.	L/5.	L/5.
Pentachlorophenol	L/0.1	L/0.1	L/0.1	L/0.1



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Certificate

PAGE NO 2

Pacific Wood Treating

LABORATORY NO 84095

	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
pH, glass electrode at 25°C	6.4	7.7	8.2	8.6
Specific Conductance, micromhos/cm at 25°C	410.	110.	780.	450.

parts per million (mg/L)

Chromium	L/0.005	L/0.005	L/0.005	L/0.005
Copper	L/0.005	0.005	0.005	0.005
Arsenic	0.008	L/0.005	L/0.005	L/0.005
Cadmium	L/0.002	0.002	L/0.002	L/0.002
Lead	L/0.005	L/0.005	L/0.005	L/0.005
Mercury	L/0.001	L/0.001	L/0.001	*
Barium	0.1	L/0.1	0.1	L/0.1
Selenium	L/0.005	L/0.005	L/0.005	L/0.005
Silver	L/0.01	L/0.01	L/0.01	L/0.01

parts per billion (ug/L)

Naphthalene	L/5.	L/5.	L/5.	L/5.
Pentachlorophenol	2.7	1.4	L/0.1	0.3

Key

L/ indicates "less than"

\*Insufficient sample to perform analysis.

Note: Insufficient sample was provided to perform the total phenol analysis requested on 4/3/84.

Respectfully submitted,

Laucks Testing Laboratories, Inc.

*J. M. Owens*  
J. M. Owens

JMO:bg



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# Laucks

## Testing Laboratories, Inc.

940 South Harney Street, Seattle, Washington 98108 (206) 767-5060

Chemistry, Microbiology, and Technical Services



### Invoice

Pacific Wood Treating  
111 W. Division St.  
Ridgefield, WA 98642  
ATTN: Vince McQuiggin

INVOICE NO 84095  
DATE April 20, 1984  
ORDER NO

TO PROFESSIONAL SERVICES

Analysis of WATER -----

\$2,038.00

Net 30 Days

The liability of these laboratories for the services covered by this invoice shall in no event exceed the amount of this invoice.  
Sample discarded after analysis unless otherwise requested.





# PACIFIC WOOD TREATING CORPORATION

TO DEPARTMENT OF ECOLOGY  
7272 Cleanwater Lane, LU11  
Olympia, Washington 98504

DATE 7-25-84  
RE RBT Site  
DE83-284  
DE83-468

ATTENTION ERIC B. EGBERS, REGIONAL INSPECTOR

## TRANSMITTED

☐ HEREWITH ☒ ENCLOSED ☐ UNDER SEPARATE COVER  
VIA \_\_\_\_\_  
☐ BY MAIL ☐ BY MESSENGER ☒ CERTIFIED MAIL  
RETURN RECEIPT

## THE FOLLOWING MATERIAL

Third Quarter Water Analysis Report by Laucks Testing Laboratories, Inc.

*HA Exam 15 June 84*

## REMARKS

COPY TO \_\_\_\_\_  
\_\_\_\_\_

BY *Vince McQuiggin*  
Vince McQuiggin  
Project Coordinator

# Lauck's

## Testing Laboratories, Inc.

940 South Harney Street, Seattle, Washington 98108 (206) 767-5060

Chemistry Microbiology and Technical Services

REC-  
JUL 09 1984  
P. W. T.



## Certificate

CLIENT Pacific Wood Treating  
P. O. Box 518  
Ridgefield, WA 98642-  
ATTN: Vince McQuiggin

LABORATORY NO 85070

DATE July 4, 1984

PO# 44147

REPORT ON WATER

### SAMPLE IDENTIFICATION

Submitted on 6/15/84 and identified as shown below:

### TESTS PERFORMED AND RESULTS

1) Falls	5/12	10:50	
2) Muffet	6/12	14:15	
3) Rutkowski	6/12	12:50	
4) RYF	6/12	15:50	
5) LS 1 PWT/RBT	6/12	10:30	JJM
6) LS 2 PWT/RBT	6/12	10:50	JJM
7) LS 3 PWT/RBT	6/12	11:22	JJM

pH, glass electrode at 25°C  
Specific Conductance,  
micromhos/cm at 25°C

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
7.1	7.1	7.3	7.3
160.	190.	200.	160.

### parts per million (mg/L)

Arsenic	L/0.005	L/0.005	L/0.005	L/0.005
Barium	L/0.10	L/0.10	L/0.10	L/0.10
Cadmium	L/0.002	L/0.002	L/0.002	L/0.002
Chromium	L/0.01	L/0.01	L/0.01	L/0.01
Lead	L/0.010	L/0.010	L/0.010	L/0.010
Mercury	L/0.001	L/0.001	L/0.001	L/0.001
Selenium	L/0.005	L/0.005	L/0.005	L/0.005
Silver	L/0.01	L/0.01	L/0.01	L/0.01
Copper	0.005	L/0.005	L/0.005	0.006
Total Phenols	L/0.005	0.013	L/0.005	L/0.005

### parts per billion (ug/L)

Pentachlorophenol	0.86	0.43	0.13	1.1
Naphthalene	L/1.	L/1.	L/1.	L/1.



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RECEIVED  
JUL 09 1984  
P. W. T.



Certificate

PAGE NO 2

Pacific Wood Treating

LABORATORY NO 85070

parts per million (mg/L)

5\*

6\*

7\*

Arsenic

L/0.005 L/0.005 L/0.005

parts per billion (ug/L)

Pentachlorophenol

L/1.\*\* 1.9 9.8

Naphthalene

L/50.\*\* L/50.\*\* L/50.\*\*

Key

L/ indicates "less than"

\* insufficient sample for additional analyses

\*\* insufficient sample to achieve desired limits of detection

Respectfully submitted,

Laucks Testing Laboratories, Inc.

J. M. Owens

JMO:bg



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# Laucks

Testing Laboratories, Inc.

940 South Harney Street, Seattle, Washington 98108 (206) 767-5060

Chemistry, Microbiology and Technical Services

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JUL 09 1991  
P.W.T.



Certificate

Pacific Wood Treating

PAGE NO 3

LABORATORY NO 85070

## APPENDIX A

### Surrogate Recovery Quality Control Report

Listed below are surrogate (chemically similar) compounds utilized in the analysis of organic compounds. The surrogates are added to every sample prior to extraction to monitor for matrix effects and sample processing errors. The control limits represent the 95% confidence interval established in our laboratory through repetitive analysis of these sample types.

parts per billion (ug/L)

<u>Sample No.</u>	<u>Surrogate Compound</u>	<u>Spike Level</u>	<u>Spike Found</u>	<u>% Recovery</u>	<u>Control Limit</u>
1	tetrachlorophenol	1.00	0.632	63.2	34-135
2	"	1.00	1.18	118.	34-135
3	"	1.00	0.345	34.5	34-135
4	"	1.00	1.08	108.	34-135
5	"	1.00	1.29	129.	34-135
6	"	25.0	26.5	106.	34-135
7	"	25.0	28.7	115.	34-135
Blank	"	25.0	46.2	185.	34-135
Blank	"	1.0	0.979	97.9	34-135



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# Laucks

Testing Laboratories, Inc.

940 South Harney Street, Seattle, Washington 98108 (206) 767-5062

Chemistry, Microbiology, and Technical Services



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JUL 09 1984  
P. W. T.

Certificate

Pacific Wood Treating

PAGE NO. 4

LABORATORY NO. 85070

## APPENDIX B

### Methods of Analysis and Lower Limits of Detection

<u>Analysis</u>	<u>Method</u>	<u>LLD</u>
Pentachlorophenol	EPA(1) 604	0.01 ug/L*
Naphthalene	EPA(1) 610	1. ug/L*
pH	EPA(2) 150.1	+/- 0.1 units
Specific Conductance	EPA(2) 120.1	N/A
Arsenic	EPA(2) 206.3	0.005 mg/L
Barium	EPA(2) 278.1	0.10 mg/L
Cadmium	EPA(2) 213.1	0.002 mg/L
Chromium	EPA(2) 218.1	0.01 mg/L
Lead	EPA(2) 239.2	0.010 mg/L
Mercury	EPA(2) 245.1	0.001 mg/L
Selenium	EPA(2) 270.3	0.005 mg/L
Silver	EPA(2) 272.1	0.01 mg/L
Copper	EPA(2) 220.1	0.005 mg/L
Total Phenols	EPA(2) 420.2	0.005 mg/L

\*Insufficient sample size available to achieve these limits on sample nos. 5-7.

### References:

EPA(1) = Methods for Organic Chemical Analysis of Municipal and Industrial Wastes, USEPA, 1982.

EPA(2) = Methods for Chemical Analysis of Water and Wastes, USEPA, 1979.



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# Laucks

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940 South Harney Street, Seattle, Washington 98108 (206) 767-5060

Chemistry, Microbiology and Technical Services

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P. W. T.



Certificate

5th Sample 14 Sept 84.

CLIENT Pacific Wood Treating  
P. O. Box 518  
Ridgefield, WA 98642  
ATTN: Vince McQuiggin

LABORATORY NO. 86637

DATE Nov. 7, 1984

PO# 44775

REPORT ON WATER

SAMPLE  
IDENTIFICATION

Submitted 9/14/84 and identified as shown below:

TESTS PERFORMED  
AND RESULTS:

1) LS-1	PWT-RBT	JJM	9/13/84	10:30
2) LS-2	PWT-RBT	JJM	9/13/84	10:00
3) Falls	PWT-RBT	JJM	9/13/84	11:03
4) Rut	PWT-RBT	JJM	9/13/84	12:15
5) Muf	PWT-RBT	JJM	9/13/84	13:15
6) Ryf	PWT-RBT	JJM	9/13/84	14:00
7) TB	PWT-RBT	JJM	9/13/84	12:35

pH, glass electrode at 25°C  
Specific Conductance,  
micromhos/cm at 25°C

1	2	3	4
*	*	6.9	6.9
*	*	150.	200.

parts per million (mg/L)

Arsenic	L/0.005	L/0.005	L/0.005	L/0.005
Barium	*	0.1	L/0.10	L/0.10
Cadmium	*	L/0.002	L/0.002	L/0.002
Chromium	*	L/0.01	L/0.01	L/0.01
Lead	L/0.010	L/0.010	L/0.010	L/0.010
Mercury	*	L/0.01***	L/0.001	L/0.001
Selenium	L/0.005	L/0.005	L/0.005	L/0.005
Silver	*	L/0.01	L/0.01	L/0.01
Copper	*	0.048	0.008	L/0.005
Total Phenol	*	*	L/0.005	L/0.005



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### Certificate

PAGE NO. 2

LABORATORY NO. 86637

Pacific Wood Treating

#### parts per billion (ug/L)

	1	2	3	4
Pentachlorophenol	0.1	L/0.1**	L/0.1**	L/0.1**
Naphthalene	L/1.	2.	L/1.	L/1.

	5	6	7
pH, glass electrode at 25°C	7.0	7.1	7.8
Specific Conductance, micromhos/cm at 25°C	200.	170.	13.

#### parts per million (mg/L)

Arsenic	L/0.005	L/0.005	L/0.005
Barium	L/0.10	L/0.10	L/0.10
Cadmium	L/0.002	L/0.002	L/0.002
Chromium	L/0.01	L/0.01	L/0.01
Lead	L/0.010	L/0.010	L/0.010
Mercury	L/0.001	L/0.001	L/0.001
Selenium	L/0.005	L/0.005	L/0.005
Silver	L/0.01	L/0.01	L/0.01
Copper	L/0.005	0.012	L/0.005
Total Phenol	L/0.005	L/0.005	L/0.005

#### parts per billion (ug/L)

Pentachlorophenol	L/0.1**	L/0.1**	L/0.1**
Naphthalene	L/1.	L/1.	L/1.



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Pacific Wood Treating

PAGE NO. 3

LABORATORY NO. 86637

### Key

L/ indicates "less than"

\* insufficient sample to perform analysis

\*\* elevated limit of detection due to matrix effect

\*\*\* insufficient sample to achieve desired detection limit

Respectfully submitted,

Laucks Testing Laboratories, Inc.

J. M. Owens

JMO:bg



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Pacific Wood Treating

PAGE NO. 4

LABORATORY NO. 86637

#### APPENDIX A

#### Replicate Quality Control Report

<u>Sample No.</u>	<u>Analyte</u>	<u>Replicate 1</u>	<u>Replicate 2</u>	<u>Absolute Error</u>
		<u>parts per million (mg/L)</u>		
3	Barium	L/0.1	L/0.1	0.
3	Cadmium	L/0.002	L/0.002	0.
3	Chromium	L/0.01	L/0.01	0.
3	Mercury	L/0.001	L/0.001	0.
3	Silver	L/0.01	L/0.01	0.
3	Copper	0.010	0.008	0.002
*	Lead	L/0.01	L/0.01	0.
*	Phenol	L/0.005	L/0.005	0.

\*Samples submitted under laboratory number 86637 were analyzed together with samples from another source. These data, though not directly for lab number 86637, indicate QC conditions present when your samples were analyzed.



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PAGE NO. 5

Pacific Wood Treating

LABORATORY NO. 86637

### APPENDIX B

#### Spike Quality Control Report

<u>Sample No.</u>	<u>Analyte</u>	<u>Sample Found</u>	<u>Spike Level</u>	<u>Spike Found</u>	<u>% Recovery</u>
<u>parts per million (mg/L)</u>					
4	Barium	L/0.1	0.1	0.1	100.
4	Cadmium	L/0.002	0.05	0.039	78.
4	Chromium	L/0.01	0.05	0.033	66.
5	Mercury	L/0.001	0.002	0.002	100.
4	Silver	L/0.01	0.05	0.039	78.
4	Copper	L/0.005	0.05	0.05	100.
*	Lead	L/0.01	0.01	0.01	100.
*	Phenol	L/0.005	0.05	0.049	98.
<u>parts per billion (ug/L)</u>					
6	Naphthalene	L/1.	10.0	9.3	93.
6	PCP	L/0.1	1.00	2.17	217.

\*Samples submitted under laboratory number 86637 were analyzed together with samples from another source. These data, although not directly for lab number 86637, indicate QC conditions present when your samples were analyzed.



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PAGE NO. 6

Pacific Wood Treating

LABORATORY NO. 86637

#### APPENDIX C

#### Surrogate Recovery Quality Control Report

Listed below are surrogate (chemically similar) compounds utilized in the analysis of organic compounds. The surrogates are added to every sample prior to extraction to monitor for matrix effects and sample processing errors. The control limits represent the 95% confidence interval established in our laboratory through repetitive analysis of these sample types.

<u>Sample No.</u>	<u>Surrogate Compound</u>	<u>Spike Level</u>	<u>Spike Found</u>	<u>% Recovery</u>	<u>Control Limit</u>
<u>parts per billion (ug/L)</u>					
Blank	Benzo(k)fluoranthene	9.8	9.5	97.	55-127
1	"	28.0	16.9	60.	55-127
2	"	35.6	26.0	73.	55-127
3	"	9.8	7.7	78.	55-127
4	"	9.9	7.4	75.	55-127
5	"	9.9	6.3	64.	55-127
6	"	19.8	14.1	71.	55-127
6 spike	"	19.8	8.5	43.	55-127
7	"	9.9	10.0	101.	55-127



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Pacific Wood Treating

PAGE NO. 7

LABORATORY NO. 86637

#### APPENDIX D

#### Methods of Analysis and Lower Limits of Detection

<u>Analysis</u>	<u>Method</u>	<u>LLD</u>
Pentachlorophenol	EPA(1)604	0.1 ug/L*
Naphthalene	EPA(1)610	1. ug/L
pH	EPA(2)150.1	+/- 0.1 units
Specific Conductance	EPA(2)120.1	N/A
Arsenic	EPA(2)206.3	0.005 mg/L
Barium	EPA(2)278.1	0.10 mg/L
Cadmium	EPA(2)213.1**	0.002 mg/L
Chromium	EPA(2)218.1**	0.01 mg/L
Lead	EPA(2)239.2	0.010 mg/L
Mercury	EPA(2)245.1	0.001 mg/L
Selenium	EPA(2)270.3	0.005 mg/L
Silver	EPA(2)272.1**	0.01 mg/L
Copper	EPA(2)220.1**	0.005 mg/L
Total Phenols	EPA(2)420.2	0.005 mg/L

\*Desired LLD of 0.01 ug/L not achieved due to matrix effects.

\*\*For sample number 2, the alternate methods (213.2, 218.2, 272.2, 220.2) were utilized.

#### References:

EPA(1) = Methods for Organic Chemical Analysis of Municipal and Industrial Wastes, USEPA, 1982.

EPA(2) = Methods for Chemical Analysis of Water and Wastes, USEPA, 1979.



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Certificate

Chemistry, Microbiology, and Technical Services

CLIENT: Pacific Wood Treating  
P.O. Box 518  
Ridgefield, WA 98642  
ATTN: Vince McQuiggin

LABORATORY NO. 94387

DATE: Jan. 17, 1986

P.O. #47228

REPORT ON: WATER

SAMPLE IDENTIFICATION: Submitted 12/17/85 and identified as shown below:

TESTS PERFORMED AND RESULTS:	1)	PWT/RBT-1	12/11/85	1545	S.R.H./J.J.M. - TRANSFER BLANK
	2A)	PWT/RBT-2	12/12/85	1520	S.R.H. } MUFFETT WELL
	2B)	PWT/RBT-2	12/12/85	1320	S.R.H. }
	3A)	PWT/RBT-3	12/12/85	1400	S.R.H. } TOE DRAIN (COLLECTION SUMP)
	3B)	PWT/RBT-3	12/12/85	1400	S.R.H. }
	4A)	PWT/RBT-4	12/12/85	1445	S.R.H. } UNDERDRAIN
	4B)	PWT/RBT-4	12/12/85	1445	S.R.H. }
	5)	PWT/RBT-5	12/12/85	1530	S.R.H. - RYE WELL

Note: The designations A and B indicate where samples were submitted in duplicate. Only the "A" sets were analyzed.

	<u>1</u>	<u>2A</u>	<u>3A</u>	<u>4A</u>	<u>5</u>
pH, glass electrode at 25.C	6.7	6.9	6.4	6.2	7.2
Specific Conductivity, micromhos/cm at 25.C	6.	240.	220.	190.	190.

### parts per billion (ug/L)

	<u>1</u>	<u>2A</u>	<u>3A</u>	<u>4A</u>	<u>5</u>	Method Blank
PCP	L/0.75	L/0.75	L/0.75	L/0.75	L/0.75	L/0.75
Naphthalene	L/1.	L/1.	L/1.	L/1.	L/1.	L/1.



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Certificate

Pacific Wood Treating

PAGE NO. 3

LABORATORY NO. 94387

### APPENDIX A

#### Methods of Analysis

pH, glass electrode at 25.C	150.1
Specific Conductivity, micromhos/cm at 25.C	120.1
PCP	*
Naphthalene	610.
Arsenic	206.3
Barium	208.1
Cadmium	213.1
Chromium	218.1
Lead	239.1
Mercury	245.1
Selenium	270.3
Silver	272.1
Copper	220.1
Phenols	420.2

\* See Appendix C



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PAGE NO. 2

Pacific Wood Treating

LABORATORY NO. 94387

parts per million (mg/L)

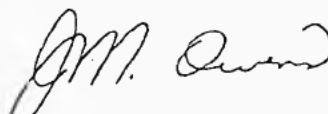
	<u>1</u>	<u>2A</u>	<u>3A</u>	<u>4A</u>	<u>5</u>
Arsenic	L/0.005	L/0.005	L/0.005	L/0.005	L/0.005
Barium	L/0.10	L/0.10	L/0.10	L/0.10	L/0.10
Cadmium	L/0.002	L/0.002	L/0.002	L/0.002	L/0.002
Chromium	L/0.01	L/0.01	L/0.01	L/0.01	L/0.01
Lead	L/0.010	L/0.010	L/0.010	L/0.010	L/0.010
Mercury	L/0.001	L/0.001	L/0.001	L/0.001	L/0.001
Selenium	L/0.005	L/0.005	L/0.005	L/0.005	L/0.005
Silver	L/0.01	L/0.01	L/0.01	L/0.01	L/0.01
Copper	0.011	L/0.005	L/0.005	L/0.005	0.13
Phenols	L/0.005	L/0.005	0.035	L/0.005	0.032

### Key

L/ indicates "less than"

Respectfully submitted,

Laucks Testing Laboratories, Inc.

  
J.M. Owens

JMO:br



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### Certificate

CLIENT: Pacific Wood Treating  
P.O. Box 518  
Ridgefield, WA 98642  
ATTN: Vince McQuiqgin

LABORATORY NO. 94496

DATE: Jan. 17, 1986

P.O. #47228

REPORT ON: WATER

SAMPLE IDENTIFICATION: Submitted 12/24/85 and identified as shown below:

TESTS PERFORMED	1)	RBT-12-22-A	PWT/RBT	SRH	12/22/85	1316	- RUTKOWSKI
AND RESULTS:	2)	RBT-12-22-B	PWT/RBT	SRH	12/22/85	1400	- FALLS
	3)	RBT-12-22-C	PWT/RBT	SRH	12/22/85	1415	- RANDALL (MILLER)
	4)	RBT-12-22-D	PWT/RBT	SPH	12/22/85	1440	- THORNTON

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
pH, glass electrode at 25.C	7.1	7.0	7.2	6.8
Specific Conductivity, micromhos/cm at 25.C	270.	220.	210.	270.

parts per billion (ug/L)

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
PCP	L/0.75	L/0.75	L/0.75	L/0.75
Naphthalene	L/1.	L/1.	L/1.	L/1.



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Pacific Wood Treating

LABORATORY NO. 94496

parts per million (mg/L)

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Arsenic	L/0.005	L/0.005	L/0.005	L/0.005
Barium	L/0.10	L/0.10	L/0.10	L/0.10
Cadmium	L/0.002	L/0.002	L/0.002	L/0.002
Chromium	L/0.01	L/0.01	L/0.01	L/0.01
Lead	L/0.010	L/0.010	L/0.010	L/0.010
Mercury	L/0.001	L/0.001	L/0.001	L/0.001
Selenium	L/0.005	L/0.005	L/0.005	L/0.005
Silver	L/0.01	L/0.01	L/0.01	L/0.01
Copper	L/0.005	0.008	L/0.005	L/0.005
Phenols	L/0.005	L/0.005	L/0.005	L/0.005

#### Key

L/ indicates "less than"

Respectfully submitted,

Laucks Testing Laboratories, Inc.

J.M. Owens

JMO:br



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Pacific Wood Treating

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LABORATORY NO. 94496

#### APPENDIX A

#### Methods of Analysis

pH, glass electrode at 25.C	150.1
Specific Conductivity, micromhos/cm at 25.C	120.1
PCP	*
Naphthalene	610.
Arsenic	206.3
Barium	208.1
Cadmium	213.1
Chromium	218.1
Lead	239.1
Mercury	245.1
Selenium	270.3
Silver	272.1
Copper	220.1
Phenols	420.2

\* See Appendix C



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## Certificate

Chemistry, Microbiology, and Technical Services

CLIENT Pacific Wood Treating  
P.O. Box 518  
Ridgefield, WA 98642  
ATTN: Bryant Adams

LABORATORY NO. 95446

DATE April 17, 1986

PO# 47079

REPORT ON WATER

Submitted 2/28/86 and identified as shown below:

SAMPLE  
IDENTIFICATION

TESTS PERFORMED  
AND RESULTS:

- 1) PWT / RBT 2/27-A 11:30 under drain sump
- 2) PWT / RBT 2/27-B 11:40 Toe drain sump
- 3) PWT / RBT 2/27-C 13:40 Toe dist. box
- 4) PWT P2 SRH 15:00 2/28/86 → production well #2

pH, glass electrode at 25°C  
Specific Conductivity,  
micromhos/cm at 25°C

40	Toe	dist. box	
1	2	3	4
6.9	6.3	6.3	---
170.	230.	290.	---

parts per billion (ug/L)

Pentachlorophenol  
Naphthalene

L/1.	1.14	L/1.	202.
1.4	4.9	6.1	L/1.



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# Laucks

## Testing Laboratories, Inc.

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Chemistry, Microbiology, and Technical Services



## Certificate

Pacific Wood Trating

PAGE NO 2

LABORATORY NO. 95446

part per million (mg/L)

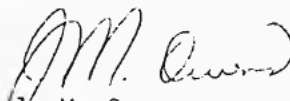
	<u>1</u>	<u>2</u>	<u>3</u>	<u>Method</u> <u>Blank</u>
Arsenic	L/0.005	L/0.005	0.005	L/0.005
Barium	L/0.10	L/0.10	0.10	L/0.10
Cadmium	L/0.002	L/0.002	L/0.002	L/0.002
Chromium	L/0.01	L/0.01	L/0.01	L/0.01
Lead	L/0.010	L/0.010	L/0.010	L/0.010
Mercury	L/0.001	L/0.001	L/0.001	L/0.001
Selenium	L/0.005	L/0.005	L/0.005	L/0.005
Silver	L/0.01	L/0.01	L/0.01	L/0.01
Copper	L/0.005	0.020	0.006	L/0.005
Phenols	0.010	0.020	0.043	L/0.005

### Key

L/ indicates "less than"

Respectfully submitted,

Laucks Testing Laboratories, Inc.

  
G. M. Owens

JMO:1aj



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# Laucks

## Testing Laboratories, Inc.

940 South Harney St., Seattle, Washington 98108 (206)767-5060

Chemistry, Microbiology, and Technical Services



## Certificate

Pacific Wood Treating

PAGE NO. 3

LABORATORY NO. 95446

### APPENDIX A

#### Methods of Analysis

pH, glass electrode at 25°C	150.1
Specific Conductivity, micromhos/cm at 25°C	120.1
PCP	*
Naphthalene	610.
Arsenic	206.3
Barium	278.1
Cadmium	213.1
Chromium	218.1
Lead	239.1
Mercury	245.1
Selenium	270.3
Silver	272.1
Copper	220.1
Phenols	420.2

\* See Appendix C



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# Laucks

## Testing Laboratories, Inc.

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## Certificate

Chemistry, Microbiology, and Technical Services

CLIENT: Pacific Wood Treating  
PO Box 518  
Ridgefield, WA 98642  
ATTN: Bryant Adams

LABORATORY NO: 1511

DATE: Feb. 5, 1987

PO# 49145

REPORT ON: WATER

### SAMPLE

IDENTIFICATION: Submitted 12/24/86 and identified as shown below:

- 1) 12/23/86 M-1 B.L. Adams *Mullett Well on 289 st up from*
- 2) 12/23/86 T-2 B.L. Adams *Toe Drain*
- 3) 12/23/86 R-3 B.L. Adams *Rose Well on 269 st down up*

### TESTS PERFORMED AND RESULTS:

	<u>1</u>	<u>2</u>	<u>3</u>	<u>Lab Blank</u>
pH, glass electrode @ 25 degrees C	6.8	6.4	6.8	—
Specific Conductivity, micromhos/cm @ 25 degrees C	310.	230.	260.	—
<u>parts per million (mg/L)</u>				
Arsenic	L/0.005	L/0.005	L/0.005	L/0.005
Copper	L/0.002	L/0.002	L/0.002	L/0.002
Chromium	L/0.005	L/0.005	L/0.005	L/0.005
Barium	0.06	0.05	L/0.01	L/0.01
Cadmium	L/0.002	L/0.002	L/0.002	L/0.002
Lead	L/0.01	L/0.01	L/0.01	L/0.01
Mercury	L/0.001	L/0.001	L/0.001	L/0.001
Silver	L/0.002	L/0.002	L/0.002	L/0.002
Selenium	L/0.005	L/0.005	L/0.005	L/0.005
Total Phenol	0.054	0.040	L/0.005	L/0.005



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# Laucks

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## Certificate

Chemistry, Microbiology, and Technical Services

PAGE: 2

Pacific Wood Treating

LABORATORY NO: 1511

	<u>parts per billion (ug/L)</u>			
	<u>1</u>	<u>2</u>	<u>3</u>	<u>Lab Blank</u>
Pentachlorophenol	L/1.	L/1.	L/1.	---
Naphthalene	0.67	0.45	0.61	L/0.04

### Key

L/ = less than

Respectfully submitted,

Laucks Testing Laboratories, Inc.

*J. M. Owens*

J.M. Owens

JMO:dr



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TABLE 1

RBT SITE WATER TESTING DATA (5/31/83)

Constituent

Bottle No.	Well or Site	Temp. °F (2)	pH	Cu mg/l	Cr mg/l	As mg/l	Fe mg/l	Total Phenol. mg/l	PCP mg/l	SO <sub>4</sub> mg/l	TDS mg/l	E.C. $\mu$ mho/cm
(4)	No. 2	54	7.51	< .03	< .06	< .01		< 0.1	<del>0.100</del>	< 80		210
(5)	No. 4	56	7.04	< .03	0.08	< .01		< 0.1	< 0.1	< 80		240
(2)	No. 5	52	7.20	< .03	< .06	< .01		< 0.1	< 0.1	< 80		260
(1)	No. 6	50	7.05	< .03	< .06	< .01		< 0.1	< 0.1	< 80		270
(6)	No. 7	56	7.20	0.08	< .06	< .01		< 0.1	< 0.1	< 80		190
(3)	Pond	58	7.24	< .03	< .06	0.017		< 0.1	0.13	< 80		300
(7)	Backgrd. (Ryf)		7.04	< .03	0.10	< .01		< 0.1	< 0.1	< 80		200

NOTES: 1) Grab samples collected by Sweet-Edwards 5/31/83 and tested by PWT.

2) Temperatures at all sites except No. 2 and pond may be biased by pressure tank and/or pipe line residence time.

## Hazard Management Specialists

133 SW Second Avenue  
Portland, Oregon 97204  
(503) 274-2217